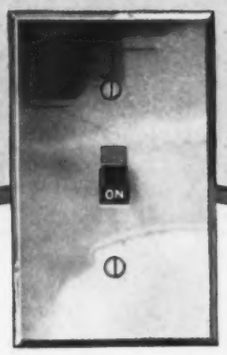
A McGraw-Hill Publication

Journal of Electricity

25 Cents a Copy | October 15, 1923 | San Francisco

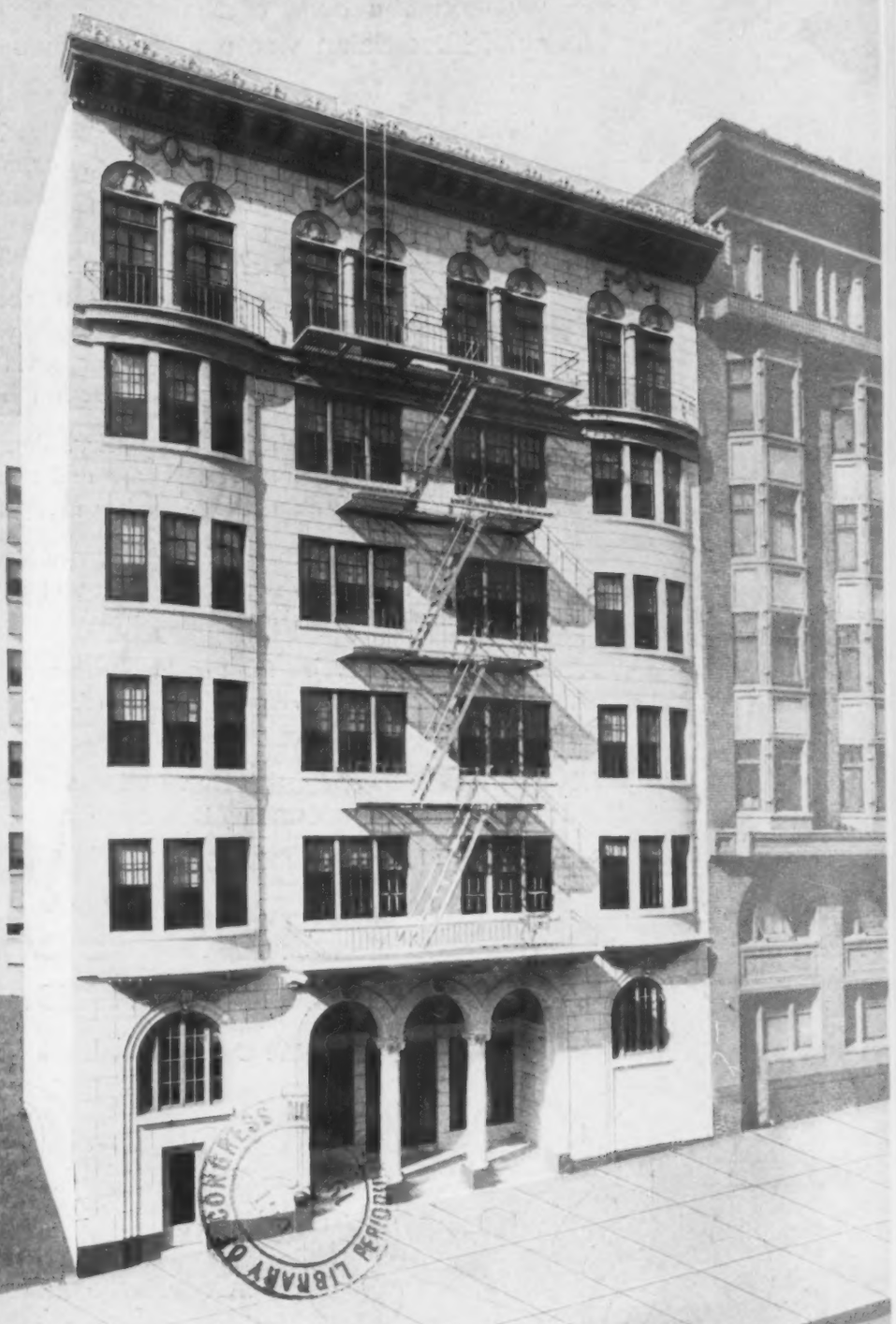


CONNECTICUT "A-1" DEVICES

The steady expansion of the building program of the West has created a rapidly growing demand for electrical devices of quality for both business and residential structures.

Corwynne Court in San Francisco is one of many high-type buildings in which Connecticut Devices meet the requirements of quality, long life, and ease of installation. This beautiful structure was wired by the Aetna Electric Co. with our "A-1" Devices furnished by the California Electrical Supply Co.—ample proof of the increasing faith placed in Connecticut material.

Complete Stocks of this Complete Line carried in San Francisco



Connecticut Electric Manufacturing Company

New York — Bridgeport, Connecticut — Chicago

Western Branch Office: 34 Natoma Street, San Francisco M. E. Fibush, Manager

An Amazing Experience

A WESTERN Portland Cement Works uses Rockbestos wire on the coils of their alternating current motors. The chief Electrician wrote us as follows about the service it gives:

> "We have had motors that were so overloaded at times as to cause the linen tape to burn off, the connections to unsolder, and yet not injure the asbestos insulation on the wire (Rockbestos).
>
> "We retaped the coils and put them back in the motors which are now running and in good condition. I find that Rockbestos insulation is tough and smooth, which was not the case with other wire we have used, and stands a lot of wear in grit and dust such as we have in the cement mill."

There's not a doubt of Rockbestos' superiority. More and more engineers are using it to replace other wires. More and more plants are saving money on its longer service and the reductions in repair bills it brings about.

Rockbestos is insulated with specially impregnated, long-fibre asbestos. This insulation is absolutely non-burning—it will not crack, crumble, or deteriorate with age.

There's a Rockbestos Wire for practically every need—Magnet Wire, Switchboard Wire, Stove Wire, Heater Cord, Motion Picture Cable and Fixture Wire.

Write us for samples and estimates on whatever style you're interested in. Put your wiring problems up to our Engineering Department.

ROCKBESTOS

ASBESTOS INSULATED WIRES AND CABLES

Pacific Coast Distributers

Baker-Joslyn Company

RELY ON LOS ANGELES SEATTLE SAN FRANCISCO SERVICE

Second & Bryant Sts.
SAN FRANCISCO

330-332 Azusa St.
LOS ANGELES

2424-28 First Ave. So.
SEATTLE

Distributers

Hot Galvanized Pole Line Hardware
Wood Poles, Cross Arms and Pins
Construction and Linemen's Tools
Porcelain and Glass Insulators
Porcelain Knobs, Tubes and Cleats
Insulated and Bare Copper and Iron Wires
Rigid Iron Conduit and Fittings
Flexible Metallic and Non-metallic Conduit and Armored Conductors
Switches, Switchboards and Fuses
Insulating Materials

Journal of Electricity entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879. Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

OCT 25 1923 © CI B588481

Journal of Electricity

A McGraw-Hill Publication

Established 1887

C. T. HUTCHINSON, Acting Editor
G. W. BARKER, Associate Editor
J. W. OTTERSON, Assistant Editor

G. C. TENNEY, Managing Editor
ROBERT SIBLEY, Consulting Editor
CLOTILDE GRUNSKY, Contributing Editor

VOLUME 51 | SAN FRANCISCO, OCTOBER 15, 1923 | NUMBER 8

Contents

Editorials 275

The Distribution of Electrical Products on the Pacific Coast 281
By E. A. KINCAID

The first article in a series which analyzes the merchandising situation on the Pacific Coast. Mr. Kincaid presents information which should be read by every member of the electrical industry.

Potential Business in Store Lighting 286
By H. H. ALLISON

Mr. Allison presents some startling figures, based on an actual survey, showing the possible business which may be developed by a campaign for better illumination of retail stores.

The Electric Industrial Truck 288
By EDWARD J. POWER

Mr. Power points out the many industrial advantages of electric platform and tractor trucks and also shows the value of this load to the central station.

Analyzing the Christmas Buying 290
By R. E. Neustadt

The important relation of Christmas business to that of the entire year is clearly brought out in this article. Mr. Neustadt gives some pointed thoughts which electrical retailers will do well to consider.

Revision of the 660-Watt Rule 292
By CLAUDE W. MITCHELL

The second paper in the series by Mr. Mitchell reviewing the changes in the 1923 edition of the Code. Proper fusing is explained, as are the provisions for grounds and for limiting the number of outlets per circuit.

Current Comment 278
Discussion 279
An Opportunity for Realtors 285
The Coast Outlet 294
Electric Merchandise Directory 297
Jobber, Dealer and Sales Agent 305
Industrial News 310
Books and Bulletins 315
Meetings 316
Manufacturer, Dealer and Jobber Activities 317
Personals 318
Trade Outlook 320

McGRAW-HILL COMPANY OF CALIFORNIA — Rialto Building — SAN FRANCISCO

PUBLISHERS OF
Journal of Electricity Pacific Mining News

JAMES H. McGRAW, PRESIDENT
C. T. HUTCHINSON, VICE-PRES. & GEN. MGR.
C. M. LINDSAY, VICE-PRES. & TREAS.

WASHINGTON, Colorado Building
CHICAGO, Old Colony Building
PHILADELPHIA, Real Estate Trust Building
CLEVELAND, Leader-News Building
ST. LOUIS, Star Building
NEW YORK, Tenth Ave. at 36th St.

Subscription rates in United States, Canada, Mexico, Porto Rico, U. S. Possessions, Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Nicaragua, Panama, Guatemala, Paraguay, Peru, Honduras, Salvador, Uruguay, and Spain, $2.00 per year, 2 years $3.60. Elsewhere $3.00 Gold (13 Shillings). Single copy, 25c. When change of address is required, both old and new addresses must be given. Notice must be received two weeks before change takes place.

Copyright, 1923
By McGraw-Hill Company of California

Entered as second-class matter Feb. 17, 1921, at the Post Office at San Francisco, California, under Act of March 3, 1879.

Member Audit Bureau of Circulation

Printed in U. S. A.

McGRAW-HILL CO., Inc., New York
Publishers of
American Machinist—European Edition (*Published in London*)
Electrical Retailing Industrial Engineer (*Published in Chicago*)
Chemical and Metallurgical Engineering
American Machinist Ingenieria Internacional
Electrical World Electric Railway Journal
Engineering and Mining Journal-Press
Bus Transportation Engineering News-Record
Coal Age Electrical Merchandising Power

"Electrical Christmas" Ideas Appear Nov. 1

CHRISTMAS is the time for giving and necessarily before anyone can give anything it must be purchased. Merchants throughout the world will soon be preparing for the trade that Christmas brings, in order that they may serve their customers who are seeking presents for their families and friends.

The electrical industry, in the past few years, has been coming more to the fore as a supplier of useful and practical Christmas gifts. Money placed in the purchase of electrical appliances has been well spent and the recipient of the gift has been well pleased with the electrical presents which have been so handy, economical to operate and good looking. An electrical appliance is used the year around and the friend who has received a toaster, waffle iron, or percolator has been thanking the donor ever since the gift has been received.

To aid the dealers in the western states that it serves, the Journal of Electricity will publish in the Dealer, Jobber and Sales Agent section of the Nov. 1 issue, a number of suggestions relating to Christmas merchandising. The entire section will be devoted to plans for the development of this trade in order that ideas used by other merchants may be presented to our readers in time for them to incorporate some of them in their Christmas selling campaigns. Two pages will be devoted to the displaying of Christmas windows which have brought business to merchants in many sections of the West. Considerable space will be devoted to the advertising campaigns that have proved successful in the past and which with minor changes can be used to advantage in the coming Christmas season.

The slogan "Give Something Electrical" will carry more weight this year than any of those that have been used before. The entire electrical industry will profit as a result and it is the purpose of the Journal of Electricity to aid in the development of the market for electrical Christmas gifts in every way possible.

That Smething About
DURABILT PRODUCTS
which users like is *Quality*.

DURADUCT
Non-Metallic Conduit

DURACORD
Heavy Duty Portable Cords

DURAWIRE
Rubber Covered Wire and Flexible Cords

Tubular Woven Fabric Company
Pawtucket, R. I.

Pacific Coast Representatives

Allied Industries, Inc.

San Francisco	Seattle	Los Angeles	Portland, Ore.
455 Second St.	1252 First Ave. So.	340 Azusa St.	781 Commercial St.

Lower Distribution Costs

IN his last message to Congress, Warren G. Harding, late President of the United States, emphasized the importance to American industry of the question of distribution, even recommending that a study of the situation be made by a Congressional committee. Industry in general, and the electrical industry in particular, has recognized for many months the need for better distribution methods. Public opinion, slow to be moulded, is beginning to make certain definite demands. And since public opinion is supposed to rule this country, it is high time that industry should heed the warning. Otherwise it is faced with the possibility of Congressional interference.

THE average layman is not an economist in the strictest sense of the word. Yet when he walks into a store and is asked to pay $150 for a certain electric labor-saving household device, which he knows has not cost more than $60 to manufacture, he begins to wonder—not without reason. The dealer agrees that the price is high, but . . . . The jobber makes the same admission, assures him that he has taken no profit at all, but . . . . The manufacturer declares that he purchases materials as cheaply as possible, employs highly efficient production methods, sells the device at a rock-bottom price, but . . . .

BEHIND all of these "buts," one fact remains in the layman's mind. He knows that somewhere between the factory and his home, $90 has been spent—perhaps misspent. And he knows that this is far too much.

AS another example from a new angle, an enterprising and progressive dealer has figured out that every time he sold a washing machine he paid $8.22 for the privilege. Again, a central station engaged in merchandising has declared that every appliance it sells causes a red ink entry to be made on its books.

IT is evident that somewhere along the line there is a leak. Either the present distribution "set-up" is wrong, or its operations are most inefficient.

WITH these facts in mind, the Journal of Electricity has made a survey of the situation as it exists on the Pacific Coast. Under its direction, Mr. E. A. Kincaid, a national authority on markets and merchandising, has spent nearly two months in the field investigating conditions. He has uncovered many interesting and enlightening facts. On another page in this issue is the first of the series of articles in which he presents his findings. He has made a study of every phase of the distribution of electrical products on the Pacific Coast. During the course of the series criticisms and constructive suggestions will be offered. It is to be hoped that they may become the basis upon which better methods will follow.

THE publication of this series is an earnest of the desire of the Journal of Electricity to be of service to all factors of the electrical industry. If even a small amount of good can be traced to the information which will be presented in this and the succeeding issues, our efforts will have been worth while.

An Important Aspect of the New National Electrical Code

THE eyes of the electrical industry are turned toward the new National Electrical Code which will shortly be placed in the hands of every man who deals with the installation of electric equipment or the application of electricity in its many various forms. Important modifications and changes have been incorporated in the new edition of the Code. Many questions will arise regarding the interpretation of some of the new rules and the application of some of the old ones.

Anticipating a desire on the part of the industry for information regarding these changes, the Journal of Electricity has arranged with Claude W. Mitchell, electrical engineer for the Board of Fire Underwriters of the Pacific, for a series of articles dealing with the new Code and its interpretation. The first of these articles appeared in the issue of September 15, 1923, and dealt with the history of the Code from its inception to its present place of importance. The second article of the series appears on another page in this issue.

In this article the changes in the muchly discussed and highly antiquated "660-watt rule" are dealt with to great length. We wish especially to call the attention of our readers to the footnote in this section of the Code which recommends the generous installation of electrical convenience outlets so that the maximum use and value of the various household appliances will accrue to the housewife. If this suggestion is followed by the electrical constructionist it will materially increase his profit on any particular job, it will result in the sale of a greater number of appliances, and will instill in the mind of the consumer the real meaning of the service which the entire electrical industry is attempting to render.

Another Noteworthy Achievement in Western Hydroelectric Engineering

THE past fortnight has marked a noteworthy achievement in western hydroelectric development. Big Creek No. 3, the largest hydro plant west of the Mississippi, has been added to the superpower system of the Pacific Coast. This power house delivers to the network of high tension lines which extends virtually from Mexico on the south to Canada on the north, 100,000 hp. in electric energy, ready, at the touch of a button or the closing of a switch, to be transformed into useful work for the betterment of mankind.

This immense block of power increases the capacity of the Southern California Edison Company's system to approximately 500,000 hp., while the capacity of the Pacific Coast interconnected system, both steam and hydroelectric, is raised to the stupendous total of 2,300,000 hp. Here is a record that has no equal in any part of the world, whether it be in installed capacity, in voltages employed or in distances over which energy is transmitted. Truly this is one of the engineering triumphs of the century.

To the mere layman, kilowatts, volts and horsepower have little or no meaning. These terms must be translated into more understandable language. We use an oft repeated illustration in defining this 100,000 hp. in terms of its meaning to agriculture, to industry and to the home. Each time that one horsepower in power plant development in the mountains is added to the transmission lines, twelve acres in unproductive land, worth $300, will have applied to it 4 hp. in motors for irrigation and general use, producing $1,000 in new crops each year and thus increasing the value of the land from $300 to an average of $2,400. To industry the meaning is equally wonderful. For every 25 hp. harnessed in the mountains an average of a factory and a half starts in one of the great cities, involving a capital investment of almost $150,000. This allows for the installation of 100 hp. in new motors, offers employment for 33 people and produces more than $200,000 in new commodities. On the basis of the increase in the use of hydroelectric energy it is little wonder that students of industrial growth are predicting a population of 10,000,000 people for California within the present generation.

Ultimately the development of which Big Creek No. 3 is a component part will total in excess of 1,000,000 hp. No less an authority than Dr. Steinmetz has cataloged the economic development and application of great water powers of the West as the greatest potential builders of agriculture and of industry—in fact, of civilization itself. The sincere appreciation and unreserved support of every loyal citizen is due those men who have fearlessly pioneered in the financing and engineering of these great hydroelectric developments.

Have You an Explanation for This Mystery?

FEW, if any, industries possess the organizations for inter-industry cooperation that this one of ours has. There are national associations, state leagues and local committees whose prime duties consist mainly of the interchange of ideas for the mutual benefit of all concerned. The degree to which the various members take advantage of the possibilities of this spirit of cooperation depends largely upon the individual. Needless to say that these possibilities are often overlooked.

For instance, there is a meeting of an important committee in San Francisco. Members attend in large numbers from cities 500 miles distant and even farther. Local committee-men, through some inherent peculiarity, fail to recognize the importance of the sessions and sit at their desks listening to the arguments of some glib salesman, rather than hang out the "Gone for the Day" sign, attend the meeting and participate in the discussions. The same would be equally true were the sessions held in Los Angeles, Seattle, Denver or Salt Lake City. There has always been a preponderance of out-of-town members, with but a paltry representation of local committee-men.

This is indeed a shameful—almost inexcusable—situation. It cannot be explained that the interest

displayed by the out-of-town men in attending is due to the fact that they are making a vacation party out of the trip. Their active participation in the discussions overrides such a statement. Nor can it be excused on the grounds of lack of interest on the part of the local men for they will be found among those present at the next meeting held outside their own territory. This is a condition that demands serious thought and attention. It is unbelievable that any man would overlook an opportunity to benefit both his business and himself, yet such seems to be the case.

Guiding the Development of the Industrial Heating Load

ELECTRICITY for heating is engaging the attention of the entire industry today. Manufacturers are devoting increased attention to this field of application and are constantly improving the design and efficiency of equipment. Central stations are interesting themselves to a much greater extent than ever before in the possibilities of electric heating and are rapidly recognizing its value as a revenue producer with a consistent and desirable load factor.

Commercial and industrial heating is rapidly developing a load that will apparently equal or exceed the motor load and the revenue per kilowatt-year bids fair to become conspicuously high in certain sections. Commercial applications include bake ovens and office and building heating. Industrial applications include electric enameling ovens, steel and brass furnaces, heat treating furnaces, fruit dehydration, sherardizing, melting pots, etc.

This load has been developed, in many cases, in spite of and not because of the power companies. In view of the very persistent growth of electric heating it would certainly seem advisable that this growth be intelligently guided and that equipment be properly engineered.

A New Opportunity for Cooperation Within the Industry

COOPERATION is the watchword of the day. It is preached from the housetops and blazoned forth in the columns of the press. It is the "sine qua non" of modern business. It is used and abused; handled and mishandled. In the electrical industry its effect has been felt in many directions, but there are those who believe that it can be developed even more extensively for the good of all concerned.

One very splendid opportunity for closer cooperation is offered to power stations and contractor-dealers. Perhaps no two branches of the entire industry are so closely allied; interwoven, almost, in their relations. The central station is, in reality, the heart of the industry. Without it there could be no electrical industry whatever, for, were no current generated, there could be no application of energy and lack of application would mean no field for either contractor, dealer or manufacturer.

On the other hand, the contractor-dealer is just as essential. Without the man who specializes on wiring, installation and merchandising, the central station could not develop so rapidly or so well. Its problems would be more complex and its relations less satisfactory. The contractor-dealer is one of the chief mediums for shaping public opinion in his locality and in times of need has been found to be a staunch friend.

The central station can offer to the contractor-dealer a corps of highly trained experts and can often extend to him assistance which he cannot get elsewhere. Particularly is this true of engineering and technical advice. The power company has a very definite common interest with him in seeing that installations are standard in character and of such a nature to encourage the use of energy consuming devices—which in turn means the greater sale of appliances and apparatus.

It is therefore logical and self-evident that, with this common interest, and a better understanding of their mutual and individual problems, both central station and contractor-dealer could function more efficiently. Here indeed is an excellent opportunity for the practical application of the letter and spirit of cooperation.

A Timely Questionnaire Regarding the Conduct of Your Business

PERTINENT queries about the conduct of a normal business are contained in a quiz sheet which has been prepared by the United States Chamber of Commerce for the purpose of better enabling a merchant to check up the operation of his business. While the questions were not prepared particularly for the electrical contractor-dealer, they apply admirably to the conduct of his business affairs. Look over the following questions. Answer them truthfully. Then see how far below 100 per cent your business measures.

1. Do you keep a "purchase account" that shows total of all goods bought?
2. Do you know what you save actually by discounting bills?
3. Do you know what it costs to buy goods?
4. How often do you take stock?
5. Do you figure stock at cost or selling price?
6. Do you make allowances for depreciation and dead stock?
7. Do you know what you owe?
8. Do you make depreciation of fixture and delivery equipment?
9. Do you know what is due you?
10. Can you furnish your bank a financial statement at once?
11. Are collections made as rapidly as accounts increase?
12. Do you know what it is costing you for allowances for customers?
13. How often do you make up a "Profit and Loss Account"?
14. Into how many separate accounts are your expenses divided?
15. Do you own the building in which you do business?
16. Do you charge rent therefor?
17. Do you charge your own salary as an expense?
18. Do you charge interest on money invested?
19. Do you know the percentage of expense to sales?
20. If fire took place, could you from your books give a complete statement of all accounts?

This practice of checking up on one's business operations every once in a while is a highly profitable one. Were it followed more often there would be less call for the sheriff and the red flag and more call for an income tax expert.

CURRENT COMMENT

Men in the electrical industry are prone to overlook some of the more serious aspects of the municipal ownership wave which seems to be sweeping the Pacific Coast at the present time.

Some Highlights Regarding Public Ownership

Apparently few communities are safe from the socialistic propagandists who would take these privately operated but publicly regulated utilities out of the hands of those men who have made such a phenomenal success of their development and operation for the past three decades and place them at the disposal of the politicians.

During the past two weeks there have been some interesting developments up and down the Coast. Vancouver, B. C., Aberdeen, Wash., and Stockton and Orland, Calif., are among the latest municipalities to seriously consider entering the power business.

In Vancouver a special report has been filed with the city council by J. G. Kerry, an engineer engaged for that purpose, covering the feasibility of the city entering the power business. He recommends the erection of a 35,000-hp. plant on the Cheakamus River with a later development on the Fraser River. He estimates the cost of the development at $7,000,000. He further recommends that the city should petition the Dominion government, asking that certain water powers be set aside for the express use of the city at any time it should so desire. In his report, the statement is made that power can be delivered to the people of the city at a cost of less than 3 cents a kilowatt-hour, where they are now paying the B. C. Electric Railway Company, Ltd., 8 cents.

The chief engineer of the City of Tacoma, which already has municipal ownership of the power business, has recommended to the city of Aberdeen that a site on the Wynooche River be immediately developed to supply the power demands of that city. A total of 27,000 hp. is available. Business men of the city have endorsed the project, providing it can be financed, and the mayor has stated that finance companies have already signified their willingness to take the bonds, provided they are issued.

Orland, Calif., has been discussing municipal ownership for several months. The city has been influenced by the action taken by the neighboring city of Redding. This latter place recently purchased the distribution system of the Pacific Gas and Electric Company within the city limits and has been distributing power for several months. Book profits have been built up to show that considerable revenue has accrued from this operation. Orland has become filled with the glamour of these reports and is now endeavoring to follow suit. A committee has been appointed to study the situation and to obtain from the State Railroad Commission a valuation of the power company's distribution system.

The city manager form of government has recently been adopted by Stockton. Sacramento, a sister city which has been operating under this form of government for several years, has determined to try its hand in the power business. Stockton, not to be outdone, has started a movement for securing data which will enable it to do likewise.

Several highspots in the situation as it exists in Washington at the present time as regards the Water and Power Act which is being sponsored in that state, were brought out in an informal discussion with several engineers at the recent convention of the A.I.E.E. One very able engineer expressed an opinion that unless immediate steps are taken by the utilities to combat the wave of favorable opinion which the propagandists are creating, the measure will become a law. He expressed the opinion that the eastern section of the state would vote against the measure and cited as an example the reception which the people of Spokane gave an ordinance setting aside several thousand dollars for studying power possibilities in that vicinity several years ago. The ordinance was snowed under and since there have been no further murmurings for municipal ownership.

In Tacoma, the Water and Power Act is also liable to meet with little approval as the people seem perfectly satisfied with the present operations of the municipal system. It is argued that the voters will be loath to turn over to outsiders a development which appears to be making a suitable profit for the city.

The opinion was expressed that in Seattle, exactly the reverse would be true. Rumors have spread that the reason for the proposal of the Water and Power Act was to enable this city to secure outside aid in financing what would otherwise be a fair-sized "white elephant." In the discussion of the situation, the statement was made that Seattle and vicinity are the logical localities for a good-will campaign on the part of the public utilities, if they would defeat the bill.

Valuations of the distribution systems of the Pacific Gas and Electric Company and the Great Western Power Company have been secured by the City of Sacramento from the State Railroad Commis-

sion. The values set by the commission exclusive of severance damages are considerably in excess of the estimates made by the city engineers. However the city is not deterred and is going ahead with its plans. The following paragraph from an editorial in a recent issue of the Sacramento Bee is exemplary of the attitude in that city:

California's fight is hard enough; but it is only a one-stage affair. It involves no coal, and does not necessitate the fighting of two sets of monopolistic interests. It is simply a question of getting the sources of power into the hands of The People.

This will be hard enough; but it has got to come sooner or later. Electric power and public ownership of it are two inevitable developments of the next few years.

Any other sort of power is wasteful, and any other sort of control has long since been proved politically and economically undesirable.

In bringing about the change of control California will have to pay a high price for the mistake of having allowed that control to get away from her in the first place. But at any rate, she will not have to pay as high a price as parts of the East where there is no water power.

Commenting on the statements made by Dr. Steinmetz during his recent visit to the Coast, the Bee says:

With regard to almost all public utilities, there is theoretically much to be said in favor of monopoly—singleness of possession and operation, far better suited to public ownership for public benefit than to private ownership for private profit.

The curse of private ownership and monopoly is the disposition to domination and corruption of government, the courts and every sort of regulative body. It invades every branch of the body politic; seeks to control all appointments, nominations and elections to office, from chief of police to the presidency of the United States, and also the membership of every legislative body, from city councils to the congress at Washington.

So, if with relation to electrical or other public service, the choice finally must be between private monopoly for profit, or public ownership for public benefit, The People of California scarcely could hesitate which to choose.

A hopeful view of the situation throughout the country is taken by the Daily Commercial News (San Francisco) in an editorial entitled "Getting Tired of It." After summing up the questionable actions on the part of the utilities during the early history of the business, which tended to place them in a bad light, this editorial says:

While these things are not fresh in the minds even of those who experienced them, they are not entirely forgotten and they form readily a foundation upon which may easily be erected the demand we have from time to time seen in play for public ownership of public utilities.

The generation that is now coming upon the scene is not very particular one way or the other.

It has no unpleasant memories to serve and no ancient grudges to satisfy.

And so there is a better opportunity to reason with it, if it may be induced to give up the time for the presentation of facts.

A very hopeful indication of capacity to judge fairly is afforded by the defeat of the Water and Power Act, a piece of Socialism which would have plunged the credit of the State into ventures the outcome of which could not be regarded as other than questionable at best.

That another attempt will be made to foist this upon the public is reasonably certain; meantime, we have the example of communities giving up their public service ventures and returning to the more reliable and also more reasonable private service.

It is stated that the day of the municipally-owned light and power plant in the small town or city is about over. It costs too much to operate these plants.

The transmission line has been the weapon effectively employed by the privately owned concerns to turn the city from the municipally owned plant.

And the merit of it all is that, as demonstrated, it has saved the consumers and the taxpayers thousands of dollars.

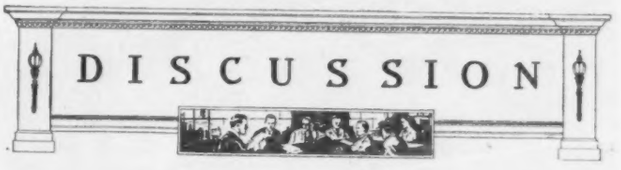
The foregoing from a country publication shows that the idea is being generally accepted, and that the dreamers are at last on the defensive.

In one state many small towns have abandoned the contest and what applies in one state is certain to become the rule, especially since the big transmission line is now the regular order, reducing expenses of generation and other incidental costs.

It is pointed out that even Organizer Townley of North Dakota economic revolutionary fame is impressed with the futility of farmers trying to conduct such highly specialized industry as meat packing, for instance.

And so the dawn of larger use of reason seems to be upon us and the fooling of the people, while not very difficult—

Is more so than it was when the renowned Lincoln made his now famous declaration about it.



From the Woman's Standpoint Electric Heat Possesses Many Advantages

To the Editor:

Sir: We, a certain stenographic department of one of your contributing firms, note the cover on your October 1 number of "Journal of Electricity" and are of the opinion that no female, as scantily clad as the pictured one, could sit so near a Majestic electric heater and not feel the direct warmth more **keenly.**

With no intention of too severe a criticism, we remain,

Yours respectfully,

"US GIRLS."

By One of 'Em.
Room 733 (?)
San Francisco, Cal.
Oct. 4, 1923.

[Editor's Note: We are glad to note that women are so quick to appreciate the many advantages of electric heat. When first shown a proof of the cover advertisement mentioned above, we were quick to grasp its appeal to the male of the species and are equally pleased to learn that its attraction is not lost to the female. We might add that it is not our custom to publish anonymous communications, but since a little detective work on the part of the office boy resulted in the discovery of the identity of the writers, we are able to offer the letter to our readers without apologies.]

BIG CREEK No. 3, the largest hydroelectric plant west of the Mississippi, with a capacity of 75,000 kva., has been placed in operation by the Southern California Edison Company on the headwaters of the San Joaquin River. The plant is a fitting monument to its builders.

The Distribution of Electrical Products on the Pacific Coast

By E. A. Kincaid

Associate Professor of Commerce, McIntyre School of Commerce, University of Virginia

THIS is the first of a series of articles on the marketing of electrical products of all classes on the Pacific Coast. Realizing that the question of distribution is one of the most important facing the electrical industry, the Journal of Electricity took advantage of the presence of Mr. Kincaid on the Pacific Coast during the summer and induced him to make a field survey of the situation. This article deals with the potentialities of the Pacific Coast market.

IN this and a series of subsequent articles the writer proposes to discuss the conditions under which electrical products are now marketed and merchandised on the Pacific Coast. The term products is used because it best covers the various lines of electrical goods that will have to be given consideration. When the word is used the reader will understand it to include appliances, fixtures, schedule materials, materials used in the generating and distribution of current, materials sold to transportation and industrial corporations, and in fact everything that is used in connection with the generation, transmission and application of electricity.

The justification or explanation for this series of articles grows out of the desire of the Journal of Electricity to serve all factors in the electrical trade. While the discussions will generally be written from the point of view of the manufacturer of electrical products for purposes of a sound perspective, it is hoped that constructive suggestions will be made for the benefit of all middlemen in the electrical field as well as consumers. The Journal has but one motive—to serve all interests in a constructive way. Often criticism brings about reforms of a constructive character and when anything is said in a critical spirit it will be for the purpose of stimulating and suggesting improvements. However, the chief purpose of the series will be to describe the electrical situation as clearly and accurately as possible so that he who runs may read.

There are some fundamental principles that bear upon the electrical industry along with all other industries. These must be stated, since they constitute the ground work for the consideration of the several subjects which will come in for more or less detailed treatment. Let it be remembered that there has been an industrial evolution in the United States the significance of which must here be taken into account. During the period ending about 1880 the means of distribution were developed out of proportion to production of goods. Markets sought goods. As a result there was concentration upon production to such good purpose that the period following 1880 may be characterized as one in which distribution lags and production exceeds the mechanism of distribution in development. During the first period a seller's market existed with competition mostly on the side of the buyers. Since 1880 the situation has in general been reversed and now manufacturers face a buyer's market with competition mostly on the side of the sellers,—the manufacturers.

The results of the general situation which has prevailed in the industrial world since 1880 are significant. The economic aspects of markets and marketing have, for the most part, been slighted. Merchandising has received but slight attention until recent years. Suddenly much fault began to be found with the mechanism of distribution for all sorts of products. While more noise has been made about the share of the consumer's dollar that goes to the middleman as compared to the share that goes to the farmer, it does not follow that the problem is any less important in the field of raw materials and manufactured goods. The fact is that manufacturers in all lines are now giving deep consideration to the marketing system by which their goods move to the ultimate consumer. There is now in process a fairly widespread effort to put the machinery of distribution on a footing that will compare favorably with production.

The manufacturer is studying distribution out of sheer necessity. The unit cost of factory production depends upon the volume of output. The volume of output, in turn, depends upon the absorbing power of the market. The manufacturer seeks to achieve that scale of operation that will bring his costs per unit of output to the lowest possible point. His power to do this means that he becomes a more effective competitor and his chances of success are thus vastly increased. In passing it might be stated many manufacturers have failed to locate just that point where land, labor and capital are most favorably combined. To put the matter another way, many have over-expanded and society has thereby been burdened with undue cost of production. Over-development of a given plant is just as burdensome as under-development in that the lowest cost per unit of output is not attained at either stage. Moreover, the tendency of manufacturers to expand until the lowest cost per unit of output has been attained has led to over-production in many lines.

Relation of Distribution to Production

It must be remembered by manufacturer, distributor and consumer, that one of the great driving forces, if not the greatest, is the effort of the manu-

facturer to achieve that volume of sales which will permit him to operate his plant continuously and thus lower his unit cost of production. This means that the chief pressure that is now being brought to bear on our distributing system originates in the fundamentals of manufacturing economy. There is yet another influence which plays upon the manufacturer. He must accept this proposition, that his goods are not really produced until they are sold over the counter or are in the hands of the ultimate consumer. From this it follows that the actual cost of production runs concurrently with the process of distribution. The heavier the burden of the mechanism of distribution the greater the costs of distribution to ultimate sale. To give each middleman the margins which will enlist his best effort may mean a final selling price that makes the manufacturer's product a luxury when, for the sake of his best interests, it ought to be a staple. One of the chief purposes of modern advertising is to take goods out of the luxury class and put them in the staple class. The achievement of this result means a broader market. The broader the market the more stable it is. The greater the stability of the market the less the risks of industry. What manufacturer is not interested in the progressive minimization of the risks to which his invested capital is subjected?

Definition of Marketing and Merchandising

The manager of the distributive system of one of the great electrical manufacturing concerns defines marketing as dumping goods on to the jobber, while merchandising is held to mean selling to the user. This usage has the merit that the terms marketing and merchandising are distinguished. Too often they are used synonymously and thus make for confusion. For the purposes of this series of discussions a somewhat different meaning will be given to these terms.

> (a) Marketing will be used to mean the working out of the route or channel by which goods shall move from the manufacturer to the user. (b) Merchandising will include all those various practices by which the movement of goods through a given marketing channel will be facilitated.

When the marketing process has been worked out, the manufacturer has still to confront the merchandising policies of the middlemen that he has decided to make use of. These policies must be watched. They have to function if the marketing system is to meet the tests. There are still many manufacturers who think of their distributing problems as ending with the jobber, if it so happens that they sell direct to jobbers. Thinking business men know that such a point of view is notable for its weakness. Goods are sold when they are sold to stay sold and in the hands of the user. It is not inaccurate to say that up to that time mere distribution has been going on. One of the outstanding problems today is to find a route to market such that every middleman made use of shall be a real merchant.

One of the chief explanations for the present tendency to break away from old marketing methods arises from the desire, the necessity, of finding middlemen who have real merchandising ability. This situation has been brought to the fore by the competition of manufacturers, by their determination to break into the market and to hold such portion of that market as they have been able to grasp. What does a manufacturer care about the orthodoxy of his marketing methods unless they give him the necessary volume in sales? What does he care about being "regular" with the trade unless being so will permit of the successful operation of his plant? Some of the most vehement "regulars" of today were at one time most highly irregular. The ethics are made to fit the economic forces that have to be met. It has always been so and it bids fair to remain so.

In the opinion of the writer all the fuss that has been made and is being made about being regular has its amusing side. As long as there are manufacturers and middlemen who try to set standards of regularity, there will persist an opportunity for irregularity. The existence of the former makes room and opportunity for the latter. If by being irregular a manufacturer can live and push on, then the economic force that makes for his survival consists of his being irregular. The writer does not wish to be understood as saying that cooperation to bring about certain standards of business practice is not a good thing. It is a good thing. At least it may be made so. But this fact remains to be confronted; a weak and struggling manufacturer will find any route to market that will give him the volume of sales essential to his industrial life. The route to market that meets this test is for his purpose highly ethical. The only test of what is ethical in the business world is the test of what is economically justifiable.

Aspects of Distribution

It is the purpose of the writer to bring out the marketing methods that are used by eastern and other manufacturers on the Pacific Coast and then to discuss as fully as may be the merchandising policies that are in vogue. The discussion of these two main aspects of distribution will, it is hoped, throw light of a constructive character on the problems of the electrical trade of this great region. But quite regardless of the region that may be under consideration let this fact be kept well in mind—the manufacturer of today must choose whether he will function as his own distributor from first to last or bend his energies to help the middlemen function. To those of you who are following the tendencies of the times it is enough to say that both methods are being followed.

It is known that one large manufacturer has opened a number of retail outlets. Still others contemplate similar action. Of course it is said that these are mere service stations such as the Singer Sewing Machine Company and other concerns operate and that it is not in any sense the faint beginnings of a general invasion of the retail field. Granted. But this point remains for consideration; suppose this or some other manufacturer should discover the existence of unavoidable economic evi-

dence that it could conduct its own retail distribution more efficiently than any one else could do it for them, what will be the upshot of the matter? I am not saying that any such discoveries will be made or that they are being sought, but I am saying that economic forces are going to drive manufacturers into those marketing and merchandising methods that prove to meet their problems best and, moreover, **who is to say what discoveries will be made** by some unbiased and truth-seeking thinker among the electrical manufacturers of today?

It may well be that I will be charged with being academic and theoretical. If so I shall not be annoyed for any such first-hand impression is sure to melt away before I am through with these discussions. But suppose I am theoretical! Just let me say that the manufacturers who are going ahead today are men who have worked out theories and then tried them out.

The field of practical business is today the greatest laboratory for experimentation that can be found. New ideas are being tested every day and it is in just this way that progress is being made. Henry Ford, the much-quoted and abused, was a man with a theory that worked. So was Thomas Edison and so were, and are, many others. There is no field so full of romance, the romance of actual life and achievement, as the field of everyday economic endeavor. Many a successful business man is in the game because of its lure, rather than merely for the sake of the money that is to be made. The so-called hard-headed business man has been found to be a man of many sides, generally of high intelligence and certainly interesting. Such are the experience and impressions of the writer respecting the leading men in the electrical field on the Pacific Coast.

The United States is so vast a country that one cannot readily generalize concerning it. The problems of the electrical industry are likewise so great that one dare not generalize respecting them. The manufacturer's problems of distribution possess certain well defined general aspects which might be described as national in scope. But since the country is divided into certain fairly definite geographic regions or provinces and conditions in these, in turn, very materially influence industrial and economic activity, it seems at once logical and wise to examine the problems in the electrical field from the point of view of a particular province at a time.

Definition of Pacific Coast

The Pacific Coast is a great geographic province in itself. Its industrial organization is vastly affected and largely determined by definite geographic controls. The great mountain ranges that for so long isolated the West from the rest of the country have been and are the determining geographic factor in the economic development of the region. These mountains contain relatively few and insignificant deposits of coal, but they provide an immense resource in the form of water power. It is true that there are notable oil fields but it is also true that power from this source cannot last. The industrial future of the Pacific Coast as a manufacturing region depends upon the conservation and use of its water power resources.

From the point of view of the manufacturer who (a) seeks access to the markets of the Pacific Coast or (b) the manufacturer who seeks to broaden his grip on the markets with which he has already made a contact, just what is the Pacific Coast? For our purposes the Pacific Coast must be defined as the three coastwise states of Washington, Oregon and California, together with the hinterland that is naturally tributary to the distributing centers located in these three states. By the terms of this definition the Pacific Coast becomes a rather extensive region. For this reason it is well to refer to the Pacific Coast as the Pacific Coast territory in just the sense that a manufacturer would use the expression when blocking out the distributing regions for his product. When the established methods of doing business in this great section are taken into account and the various ramifications of distributing agencies now long established at seaport cities are considered, the Pacific Coast territory appears to be a region including eleven states, forty per cent of the area of the United States and about eight per cent of its population. In terms of water power resources the situation is as follows:

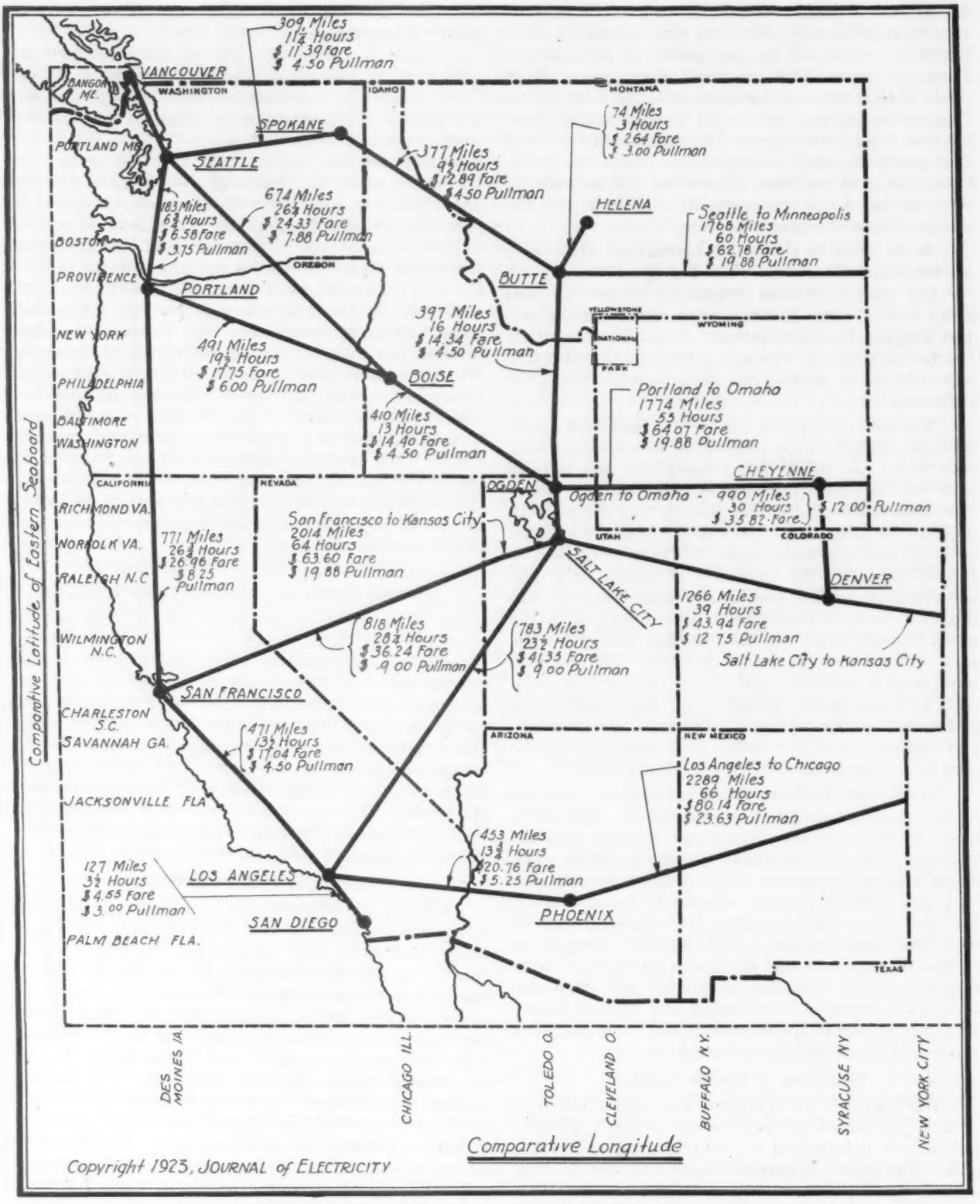
Atlantic States	9,348,000 hp.
Central States	7,360,000 hp.
New England	1,951,000 hp.
Pacific States	40,701,000 hp.

Since it is estimated that the oil deposits cannot survive the next fifty years and since the coal is generally soft and comparatively unimportant in extent, it must be clear that the future of the Pacific Coast depends, to a marked degree, upon the development of hydroelectric power. Viewing matters in terms of the long run, what more persuasive data are needed to convince electrical manufacturers of the importance of entering the field early and building up distribution there on sound lines?

Analysis of Coast Conditions

But let us consider the existing inducements to a sound understanding of Pacific Coast conditions. These need to be well considered, for the Pacific Coast is largely **terra incognita** to the eastern manufacturer of electrical goods. The subject is of particular interest to him because the great bulk of all electrical goods now being marketed in the Pacific Coast territory is manufactured in the East. There are definite reasons for this situation. The manufacture of electrical products first developed in the East because of those conditions which, in general, make for localization of industry. The momentum of an early start, ready access to raw materials, availability of an adequate supply of skilled labor, abundance of transportation facilities and relatively short hauls to numerous jobbing centers are factors that must be taken into account here.

While it is true that the bulk of the electrical goods now being distributed on the Pacific Coast is produced in the East there are a few instances of manufacture of electrical goods in the West. Moreover there is reason to expect this industry to ex-



The Western Market for Electrical Products

With 40 per cent of the area and but 8 per cent of the population of the United States, the West presents a peculiar problem for the distribution of electrical products. Yet it is one of the most fertile markets. It possesses 17 per cent of the total number of wired homes. It uses 20 per cent of the central station electrical energy, has the lowest rates for energy and possesses two-thirds of the water power resources of the country. On top of this it has 52 per cent greater per capita wealth than the rest of the nation. The above map gives some idea of the major distribution centers, the connecting routes and the time and expense required in covering this territory.

pand there. The Pacific Coast territory now has a great development of hydroelectric power; there are great power resources available for development, which is certain to come at no remote period; high-tension power transmission lines have reached a high state of development and power is now within easy reach of the centers of population where manufacturing is now developing; climatic conditions are favorable for all the year around production; oriental and South American markets are readily tapped from Pacific Coast ports; the population is growing rapidly and it is educated to use electricity in all available ways. These are considerations which form a premise upon which one may reasonably build the faith that ultimately there will be an electrical manufacturing industry on the coast. The erection of branch factories on the Pacific Coast would even now go far to remove some of the transportation and distribution problems that exist for eastern manufacturers doing business in the far West. The exact nature of these problems will be brought out hereafter.

Speaking of conditions as they are, the most outstanding aspect of the Pacific Coast territory as a market for electrical products is the ignorance of eastern manufacturers concerning it. A corollary of this fact is another, that manufacturers' representatives on the Pacific Coast are generally unanimous in their opinion that their eastern principals are not well informed as to Pacific Coast conditions. They are afflicted with a vagueness concerning the region which is clearly the result of remoteness. It is the hope of the Journal of Electricity that this series of articles will be a contribution in the direction of alleviating, if not removing, this situation. In this connection let me say that there are certain outstanding facts which must be taken into account in making an estimate of the Pacific Coast as a market. Furthermore, these facts play a large part in explaining the present organization of that market, the methods of distribution in vogue there and the efficiency with which they function. The facts that I allude to are as follows:

Area in square miles	1,189,140
Population	8,900,585
Jobbing Centers	12
Wholesale outlets for electrical appliances	69
Retail outlets for electrical appliances	1,900

Wired homes make 17 per cent of the total number of wired homes in the United States, or a total of 1,414,200. From this fact it follows that the West is the most highly concentrated electrical market in the world.

The West has 52 per cent greater per capita wealth than the rest of the United States.

Over 20 per cent of the central station electrical energy developed in the United States is used in the West.

The average cost of electricity to the consumer is 1.36c. per kw-hr. and this is lower than for any other section in the United States.

The West has forty million of the sixty million horsepower of water power resources in the United States.

Add to these facts the following considerations: Eastern manufacturers can reach the centers of population in this great territory either by land or water transportation routes. Distribution is now largely dominated or controlled from the great ports of Seattle, Portland, San Francisco and Los Angeles. The electrical trade is well organized and in the hands of an exceptionally able and progressive body of business men who know the industry and the country they serve. The distances between jobbing centers is great when compared with conditions in the East and this is one factor which must be taken into account in working out a marketing system for the Pacific Coast territory. The significance of this factor will come up for fuller treatment hereafter.

With these general considerations in mind the writer proposes to take up the actual distributive system as it now exists on the Pacific Coast and describe and account for this system in the next paper which will be published in an early issue.

An Opportunity for Realtors

IN this day of keen competition among builders and real estate sales agents every effort is being put forth to add to a house those things which will make it a home and will increase its salability. Many real estate operators have been quick to take advantage of the possibilities of electrical equipment and have gone far in the electrification of their properties. This equipment has now reached the point where the all-electric home is no longer a novelty but is instead in constant demand. Probably no other single thing which has been introduced into American home life has so quickly and so thoroughly been accepted by the public as has electric application, and certainly any house now constructed and not well equipped electrically is a very great liability and not at all an asset.

Some realtors have not yet taken advantage of the sales possibilities of electrically equipped houses to the fullest extent available. Many have equipped their buildings with splendid apparatus and have made adequate provision for the use of electricity but have, strangely, failed to capitalize on the equipment in their advertising and other publicity. It has remained for a home owner in Denver to make a real feature of this equipment in his advertising.

6-ROOM BUNGALOW, 2-CAR GARAGE
210 S. HUMBOLDT

Tile bath with built-in tub. Large rooms thruout, **elaborate electric system with finest fixtures,** oak floors, colonnade arch, linen closet, pretty fireplace. The quality of this place will impress you. Near Steele school, Washington park and boulevard. Built by owner for home. South 6332J.

The advertisement reproduced above shows how he makes good capital of an adequate electrical installation and uses the electrical possibilities to assist in the sale of his property, particular emphasis being placed on the fact that the home is wired for the convenient use of appliances. Floor plugs and other convenience outlets make this possible. The adver-

NOT FOR SALE

Our service is yours for the asking. We'll show you how a home, new or old, should be wired—no charge or obligation.

Electrical Co-Operative League

Champa 7273 **301 G. & E. Bldg.**

tisement of the Electrical Cooperative League is typical of the service which is freely offered by the entire electrical industry to those who will avail themselves of it.

Potential Business in Store Lighting

By H. H. Allison
Illuminating Sales Engineer,
Pacific Gas and Electric Company, San Francisco, California

THE possibilities of increased business for every branch of the industry are vividly portrayed in this article. Conservative estimates, based on actual survey, show potential profits in return for initiative which should approximate $125,000 per thousand stores in nearly any city. This figure is explained in detail by Mr. Allison, who shows how manufacturer, jobber, dealer and central station will benefit by greater activity in promoting better store illumination.

THE electric lighting industry enjoys an enviable position in the "Land of Opportunity" at the present time. The long period of non-development is at an end and an era of prosperity faces everyone connected with illumination. The development of this field has been rather slow in spite of the fact that electric current was first generated and used for illumination purposes. Although wonderful inventions have contributed the gas filled tungsten lamp, practically no progress had been made in lighting methods until a short time ago.

Lately, however, illumination has been given a stimulus by a small group of engineers who proved to a doubting business world the dollars and cents value of higher intensities. Better methods are now being devised, experiments and research work are being carried on, and real progress made. The manufacturing world was first to realize the commercial value of light by being shown the increased production and safety resulting from good installations. Since then, it has been found that wherever people are engaged in activities which require illumination, their particular task is performed more swiftly and more easily, with more comfort and safety, under higher intensities. It does not require a great deal of imagination to realize the amount of additional lighting facilities which are necessary to supply this newly developed market. Every manufacturing and industrial establishment becomes a live prospect for more and better equipment, as well as offices and night schools, to say nothing of street lights and public buildings as well as homes.

The greatest untouched field for better lighting, however, has been opened by recent demonstrations of the sales value of light. Although merchants long have realized that good lighting was desirable, it has heretofore been considered ornamental rather than a necessary part of the store fixtures. It is now known, however, that high intensity illumination actually sells merchandise. Consequently merchants everywhere are seeking better lighting installations in their stores to swell their volume of business and overcome the keen competition. In view of the fact that the great majority of stores are provided with lighting systems planned and installed before the present wealth of knowledge on the subject was analyzed, and that much of the shop lighting is of a character susceptible of large improvement, it will readily be understood that here is a great field for new business.

Unfortunately, merchants who are desirous of securing better illumination are at a loss to find those who know how to put in correct installations. The lamp manufacturers are making a great effort to spread the knowledge of correct lighting methods by conducting classes in illumination design and by publishing literature on the subject. Both the National and the Edison Lamp Works of the General Electric Company have published a series of bulletins covering all phases of lighting which forms the most complete reference on the subject available. Everyone in contact with commercial lighting should become thoroughly familiar with this information, especially that part relative to stores and shops.

The average contractor-dealer has not given the illumination problems enough attention to permit him to properly design a good installation. Similarly, the architects and engineers have not made a special study of the subject to enable them to give expert advice. The power companies now realize that this service can be very profitably rendered by them, and many of them have added illumination engineers to their organizations. The Pacific Gas and Electric Company has placed an illumination expert in each of its divisions for the purpose of encouraging and advising the consumer on the proper use of light. Not only is it possible by this means to educate the dealers and public in better lighting methods, but also new fields of business may be explored.

This company has just finished a survey of the stores in San Francisco, to determine their potential business for the electrical industry. Partial results of this survey have been tabulated on 1,000 stores representative of the entire city and comprising all classes:

Segregation	Properly Lighted	Poorly Lighted — Insufficient Illumination	Poorly Lighted — Obsolete Fixtures	Poorly Lighted — Wrong & Bare Lamps
Store interiors	1%	81%	54%	41%
Display window	2%	36%	76%	21%

The amount of equipment necessary to properly light the 1,000 stores has been determined by carrying the investigation of these conditions a little farther. Over 90 per cent of the merchants whose stores were poorly lighted were desirous of securing better lighting when the defects of their present system were pointed out. From this it is found that:

882 display windows, and
991 store interiors

are actual prospects for better lighting.

A conservative estimate of the additional equipment necessary to properly light each store is shown as follows:

Interior

Additional outlets per store	4
" lighting units per store	6
" lamps per store	5

Windows

Additional outlets in each store front	5
" reflectors in each store front	8
" lamps in each store front	7

Thus it is seen that the contractor-dealer has an opportunity to wire 3,964 interior outlets and 4,410 window outlets.

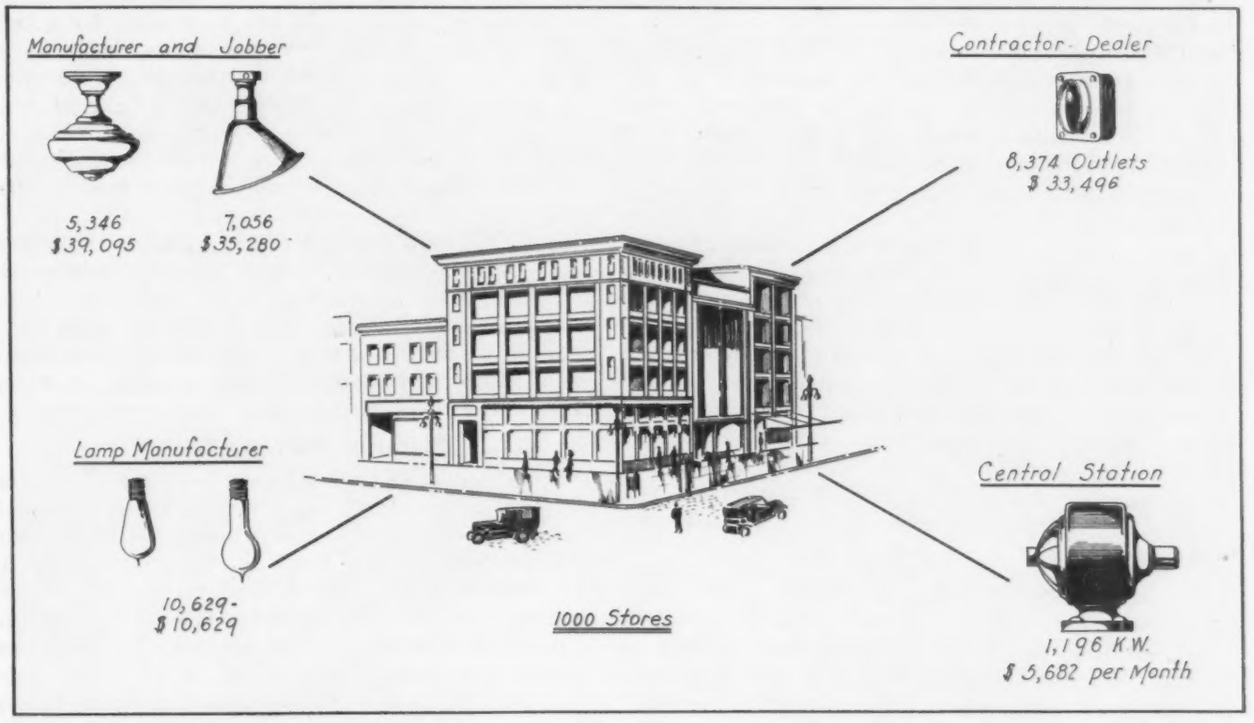
Similarly, the manufacturer or jobber would supply through the dealer 5,346 lighting units and 7,056 window reflectors.

8,374 outlets	@$ 4.00	ea.	$33,496.00
5,346 lighting units	@ 7.50	"	39,095.00
7,056 window reflectors	@ 5.00	"	35,280.00
10,629 lamps	@ 1.00	"	10,629.00

The average monthly revenue to the power companies of 1,196 kw. at five cents per kw-hr. would be $5,682.

Thus it is found that practically $125,000 worth of business may be secured from only 1,000 stores. In large cities containing many thousands of stores, the figure runs up into many millions, but the above figures relate to the average store which is found in places of all sizes.

The outstanding feature of the survey was found to be the apparent lack of interest in this class of business by the dealer. In many instances a dealer would be located between two stores using bare lamps and obsolete fixtures, yet no effort had been made to secure the two hundred dollars of new business from his neighbors.



Pictorial presentation of the sales possibilities per thousand stores attendant upon a better illumination campaign. It is interesting to note that all branches of the industry benefit by such work and that the effort should therefore be cooperative.

The lamp manufacturers will sell to the dealers 10,629 lamps for these outlets. The power companies will be called upon to supply power to the 7,974 new outlets at not less than 150 watts each, or a minimum of 1,196 kw. added load.

In placing an actual value on these quantities a very conservative estimate of the costs are used. The costs which will be used here for estimating are:

Cost of wiring average outlet	$4.00 ea.
Average price of store lighting units	7.50 "
" " for window reflectors	5.00 "
" " of lamps	1.00 "

From this, the volume of business available to the dealer is found:

It evidently behooves the manufacturer and power companies to get behind a movement to secure this business, as this survey shows that it is there. One thing is certain. Whoever gets out and hustles will secure this business, whether it be the jobber, dealer or the power company.

As the interests of all those concerned are one and the same, a good plan would be to unite in making a drive to open this untouched treasure chest of opportunity.

The Electric Industrial Truck in Business

By Edward J. Power
Director, Electric Truck Bureau, Pacific Gas and Electric Company

THE electric industrial truck is fully as important to the central station as a load builder as any other form of electric vehicle. In this article Mr. Power points out some of the selling points which might influence an executive in equipping his plant with these trucks and at the same time shows that the field for application here in the West is a broad one.

TWENTY years ago, central station companies were selling practically no electricity for motive power purposes, while today there are being consumed over 200,000,000 kw-hr. of off-peak current per year. This considerably flattens out that valley which now exists in the load curve and at the same time returns a revenue, at three cents per kw-hr., of $6,000,000 per year, certainly a return worthy of serious consideration. A large proportion of this current is consumed by the electric industrial truck.

In practically every line of business, one of the many problems which may arise is that of interdepartmental transportation. In the average plant, warehouse, railroad terminal and dock, it is the desire of every man in whose hands the efficient management of the business is placed, to move the material in the quickest possible time, and with the least waste of labor. These executives are attaining their objectives through the help of the electric industrial truck as evidenced by the thousands that are now in use. These vehicles are proving themselves indispensable in this work to operators who need a cheaper and more efficient method of moving material as they are small enough to negotiate narrow aisleways, yet sufficiently powerful to move heavy loads easily and speedily.

The Field for the Tractor

Usually the tractor is not designed to carry cargo upon its body. Its whole purpose is to haul trailers, by means of which loads of incredible weight are easily drawn. Where the loads are extremely heavy or the roadway poor, the greater tractive ability of this type of vehicle will be instantly recognized—especially in the four wheel tractor. One tractor will often displace from two to five horses in yard work, operating with much less care and supervision and costing less to operate than the feed of one horse.

Undoubtedly when long strings of express trailers have been seen being pulled through freight sheds or railroad warehouses or industrial plants it has caused wonder at the ease with which the little tractor at the head had handled the load. However, to the initiated this ease of operation is no surprise as they know just how ruggedly and compactly these machines are built.

Just recently the Southern Pacific Company has put in service at San Francisco two electric storage battery tractors that are illustrated herewith. These machines are used for pulling trains of express trailers from the ferry boats to the main line cars. As a ferry boat does not have a great deal of room for maneuvering a machine, short turning radius is essential, and consequently these tractors are equipped to steer by all four wheels. Machine No. 4 shown in the photograph has two power axles, one on each pair of wheels, while machine No. 3 has only one. By a simple adjustment another complete power axle can be slipped into place without any trouble, illustrating the compactness of the various units. Should it be necessary to transfer a unit from one machine to another this can also be done which further points out the standardization and compactness of the parts.

An excellent example of the tractive strength of these "jitneys" happened just recently when machine No. 4 pulled a string of 23 trailers weighing 4,000 lb. each, off of one of the Southern Pacific ferry boats at extreme low tide. This necessitated climbing a ramp pitched at a 45 degree angle from the deck of the ferry boat to pier level.

Elevating Platform Trucks

The value of this type of electric industrial truck is recognized through its ability to use small platforms or skids. A skid is loaded (if desired, up to 6,000 pounds), the truck is run under it and at the touch of a lever, the bore of the truck raises it clear of the floor. The loaded skid is then delivered to the point desired to be unloaded, the truck making another trip with a load to the point of delivery. This type of truck is practically indispensable to any industry, as these and similar operations are continually repeated in warehouses, factories, and other manufacturing establishments. Today this type of electric industrial truck is used in over 250 branches of industry.

In the early part of 1916, the late Capt. William Matson, president of the Matson Navigation Company, and Capt. Charles Saunders, who was then general superintendent, took a very active interest in reducing their stevedoring costs by means of electric industrial trucks. At that time there were very few electric industrial trucks in use in San Francisco, and even those in use had not been used long. Therefore, almost no data were available, indicating what saving, if any, might be expected through the use of this comparatively new type of stevedoring truck.

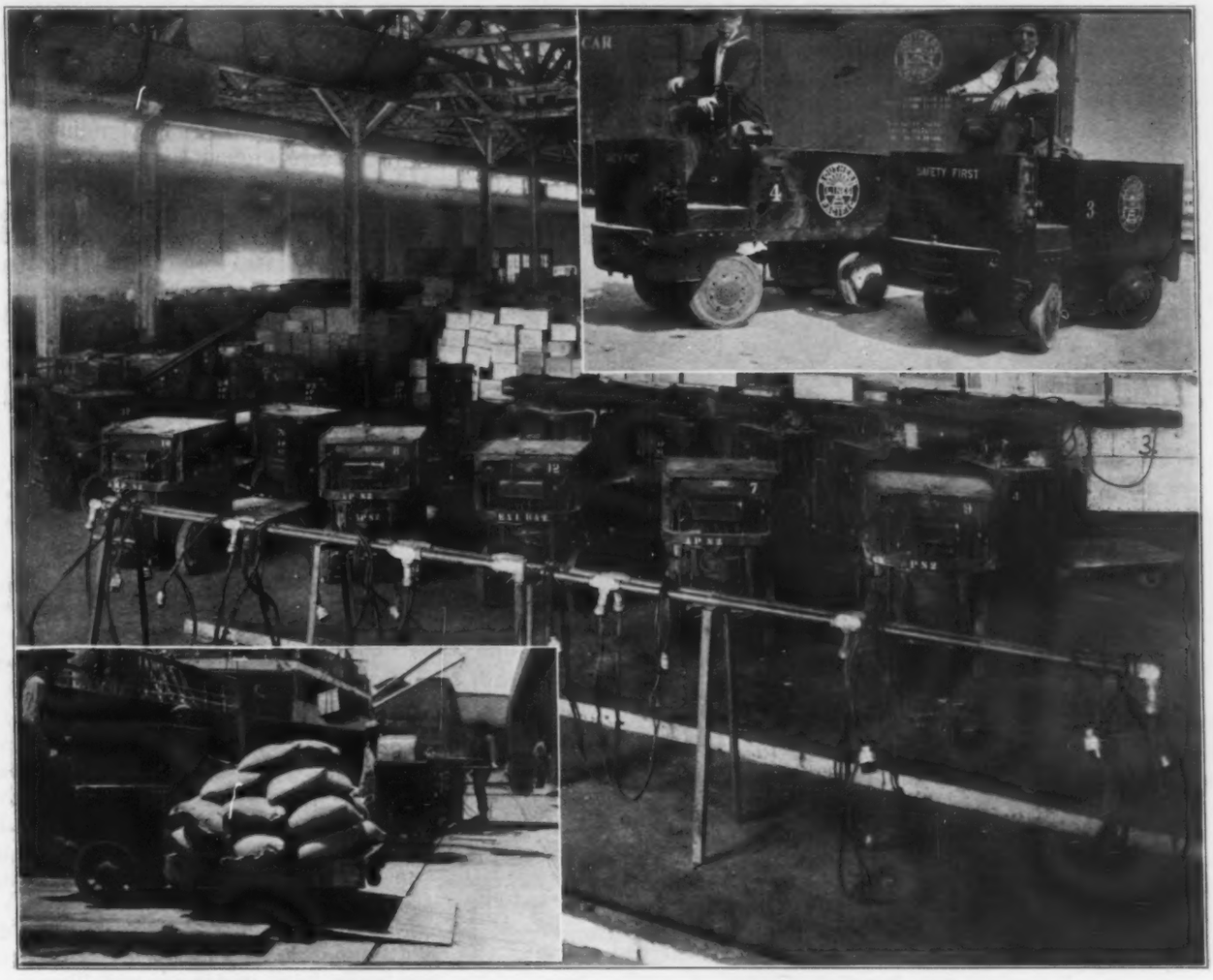
In order to gather more accurate data, a demonstration lasting several weeks was made to the Matson Navigation Company at Pier No. 28 and,

although a considerable amount of opposition was met with, the final result was that one truck was purchased for immediate delivery and three more were ordered to be delivered as early as possible. One of the latest applications is using the trucks in the bottom of the ship's hold, to bring the freight in much larger units than heretofore was possible by hand methods, up to the hook.

of trucks owned by other steamship operators, which trucks have seen from five to seven years of service.

Relative Freight Handling Costs

After the Matson Navigation Company had had the first four trucks in service for something like two years, and before they made extensive additions to their fleet, they determined that an average and fair comparison between the cost of moving freight



Upper right—Industrial trucks of the Southern Pacific Company. These trucks are used for handling freight from the interior of cars to the warehouse. Lower left—Trucks of the Matson Navigation Company which are employed for handling cargo from the holds of ships to the dock or freight cars. Center—A battery of trucks used on the docks of the Matson Navigation Company.

It is a well known fact that any kind of equipment suitable for general stevedoring work must be of a very rugged and substantial type, and, further, that failures in service are serious on account of the value of the ship's time. It is significant that electric trucks are not only extremely simple in operation, making them a practical apparatus to put in the hands of the average longshoreman, but considering the very severe nature of the work which they are called upon to do, are of remarkably long life. Several of the electric trucks in the Matson Navigation Company's fleet have seen more than six years of service. There is also a considerable number

by hand and electric truck methods could be made, as represented by the following, which was given to the writer several years ago.

It required 11 men with hand trucks one hour and fifty-five minutes to move 1,050 cases of pineapples 500 ft., the cost at the rate of wages then prevailing being $13.20. At the same time it required 9 men and one electric truck one hour and ten minutes to move 1,140 cases 400 ft., the cost of which was $7.05 including the cost of maintaining and operating the electric truck. The above work consisted of loading one car each by hand and with an electric truck.

In further explanation of the above, it will be noted that 9 men were used; this is because the object almost universally sought for is to move the goods as quickly as possible, therefore using as many men as can be economically handled on any given job. It was found that, in keeping the platforms loaded as fast as the truck could handle them, often times from five to ten men could be used to advantage to keep one electric truck of the so-called elevating, or lift type, constantly busy moving loaded platforms. As a result of this, a considerable portion of the electric trucks owned and operated by the several larger steamship companies in San Francisco, and other Pacific Coast ports, who do their own stevedoring, are of the lift type because of the comparatively greater amount of work which can be performed with this type of truck.

Tier Lift Truck

After the above comparisons, both as regards time required and cost of handling freight by electric lift trucks as compared to hand methods, the Matson Navigation Company added to their fleet at frequent intervals, until they are now operating 32 electric trucks.

There is a very wide range of usefulness for the tier lifting truck. Where containers are stocked in tiers or where trucks, box-cars, etc., are to be loaded, this truck can be operated efficiently with the minimum of lost motion. The platform is raised to the desired height by power from the battery; then the truck is driven into position and the load slides off. With this type of truck a 4,000-lb. load can be raised 75 in. in one minute thirty-seven seconds. This machine, by doing the heavy lifting heretofore done by man power, makes the work of the men easier, thus reducing both labor turnover and accidents.

Many factory executives have undoubtedly seen the "electrics" in operation at railway terminals and have admitted they were a good thing, a necessity under present day standards of efficiency, yet they may not have realized that the use of similar trucks and tractors, perhaps of a type more applicable to their individual requirements, might prove just as effective in their own plants as in the railroad terminal. On investigation these men will find that electric transportation may be had economically and with a high degree of efficiency.

Analyzing the Christmas Buying

By R. E. Neustadt

Manager, Retail Trade Association,
San Francisco Chamber of Commerce, San Francisco, California

THE buying of Christmas stocks should be done as a part of the constructive work of the entire year's program and should be based on analysis of sales as well as on judgment. Mr. Neustadt gives some pointed thoughts for the consideration of every retailer of electrical appliances.

DRIVING in a crowded thoroughfare is no different than driving along a country lane—only it's more so. Likewise, merchandising for the Christmas season is just like merchandising for the most average month of the year, only it's more so. The holiday season enhances the difficulties, dangers and opportunities of retailing, but in no way changes them.

The merchant is at all times in much the same position as the newspaper editor or the theatrical manager. He must give the public what it wants and still must assume certain responsibility in deciding for the public what it shall have. The difference is sometimes only a hair line. Yet it is just this difference that justifies the existence of the independent retailer. The way in which he appreciates the distinction and assumes his responsibilities makes for his financial success or failure.

Certainly in the layman's mind, Christmas is the bonanza season for the retailer. Everybody is buying everything—the storekeeper cannot help but make money. But to anyone who knows, the Christmas business can just as rapidly use up red ink as black. The volume of sales made in the holiday season can just as rapidly pile up the figures on the debit side of the ledger as on the credit side. The very situation that is induced by the holiday spirit can make a business sick as often as it can make it healthful. Selling, like drinking, works many different effects.

The merchant is just now in the position his customers will be in in December—with the one important exception that he hopes to make a profit on his purchases, while the public at least expects only an even exchange on their gifts. He is today buying his holiday goods from the wholesalers and manufacturers. Unless he keeps in mind always the condition of his own business and the needs of his own trade, he is in danger of falling for glib salesmanship and finding himself plastered with bills on January first for non-usable goods until he looks like the traditional family father of our cartoons.

The merchant who knows the limitations of his own business and the needs of his own trade, discounts all the excitement of Christmas. He knows—by each item of merchandise—how much he will sell, how much more he should buy as a factor of safety, how far in advance and in what quantities to buy it, and how much he can afford to pay for it in order to insure his selling it at a fair price with a fair profit. Out of the experience of years, boiled down to cold hard figures, he budgets his Christmas business months in advance. Indeed, it is just an item in the budget of his whole year's business and bears a carefully worked out relation to the business.

of the other months. He knows what he sold in previous years and knows the possibilities of expanding his volume without adding to his expense of selling. He knows, too, the factors in the general economic situation that tend to increase or decrease these possibilities of expansion. Knowing these things, the buying of the goods becomes comparatively easy. Certainly buying is an art that is not easy. And selling is an art that is not easy. But merchandising by the use of known facts, plus sound common sense, can be made scientific enough to become, not easy, but at least easily controllable.

To the shopkeeper who still trades by hunch instead of figures, Christmas always acts as the vamp in the movies. What could be more alluring? A public, forced by sentiment and tradition to buy! And such attractive opportunities to purchase all kinds of knick-knacks, as well as staple articles! The situation seems to make inevitably for an expansion of selling—so he buys. Liberally, lavishly he spreads his orders around among his friends—the salesmen. He takes a chance and increases the size of his order because it looks pretty, or because the sales argument was a cracker-jack, or because the terms seem especially good, or because he feels the glow of Christmas in his manly bosom and likes the feeling of giving—orders. Such storekeepers are as gullible as they think the public are. They fall for the salesman's ads, talk and sample even more quickly than they can expect their customers to fall for their ads, talk and display.

At that, these "hunch" storekeepers often get away with it. But inasmuch as they throw away every pretext of scientific merchandising, we must credit their occasional success to luck rather than to judgment.

There are still some storekeepers who feel that Christmas, like a circus tent, is a cover for hokum. They lay in a stock of inferior merchandise and get rid of it at large prices through fancy boxes, nice ribbons and a lot of Santa Claus cotton sprinkled around their store. Such practice is fast becoming unpopular, not only with the public but also with the merchants themselves. The storekeeper who depends for volume more upon hippodroming than on merchandising will some day be as out of luck as the one-time retail cheater characterized in that famous old song—

> "He kept the sox, but he gave me the box,
> And I'll never go there any more."

The retailing of electrical supplies is at best a hazardous game. Not only are all the general pitfalls of retailing present, but there are lots of special ones due to the fact that the distribution end of the great electrical industry has not, as yet, been satisfactorily worked out. It is very difficult for a man to handle these lines exclusively. The discounts allowed by the manufacturers and wholesalers are, for the most part, insufficient to permit large enough mark-ups to offset the extra heavy selling and service costs of the business. While the number of articles is large and involves the investment of a sizeable capital, the line is so limited that it becomes difficult to spread the overhead without inflating the mark-up. In consequence the retailing of electric supplies is only occasionally handled by itself and is most often combined with other lines, such as hardware and stationery or with electrical contracting and installation work. The appearance of radio supplies has complicated rather than simplified this situation.

It is impossible to prophesy what turn the method of retail distribution of electrical supplies will take. One thing is certain;—the problems involved are so complex, and the factors affecting the solution so many that the retailer handling these supplies has to be more cautious in every step he takes than his neighbor in any other line of trade. The chances of success are so beset with special difficulties, as well as with the general hazards of commerce, that he must lean over backward in his merchandising and buy only what he feels certain he can sell at a price that will justify the transaction. He is so apt to get stuck anyway that he, of all people, cannot afford to get stung.

To all real merchants good merchandising necessitates determining first what can be sold, the cost of selling it and how much money can profitably be invested in the purchase; and then, secondly, the buying of the goods. This involves the setting of expectancies, buying limits, turnover and profit rates, the painstaking accounting of costs and inventories, and the continuous analysis of sales to determine how performance is following the program. It is quite possible to secure all this information without great expense, and without the assistance of technical super-experts. Proper merchandise control is so identical with common sense as to make it far simpler to obtain these data than it sounds.

The Christmas business is the peak point of sales volume. Properly merchandised it will carry much of the overhead of the general business, and add very largely to that little margin that makes all the difference in the annual financial statement of the firm. To be properly merchandised, it must be merchandised as a regular part of the year's business. It is well and proper if the whole year's business is keyed up for Christmas as a football team is "pointed" to the one big game.

To make Christmas merry one must take Christmas sanely. This is just as true of the retailer as of the average dub public. We must buy to sell, rather than be forced to sell what we buy. We must plan our selling—this plan will dictate our purchases. We must keep in mind the condition of our stocks, the limitations of our purse and our expense of operation. We must fore-judge what the public will want, based on our recorded experience and our knowledge of the conditions affecting the public's state of mind. There is still an element of chance here, and it is this chance that justifies charging the public something over and above our cost of operation. But we must limit this chance as far as possible by checking our hunches against known facts and holding our enthusiasm within the confines of carefully developed plans, based on sound judgment and experience. All merchants must prearrange their Christmas business to make it profitable. Particularly and peculiarly is this true of the retailer of electrical supplies.

Revision of the 660-watt Rule

By Claude W. Mitchell

Electrical Engineer, Board of Fire Underwriters of the Pacific, San Francisco, California

THIS is the second of a series of articles by Mr. Mitchell explaining the arrangement and provisions of the 1923 edition of the Code. This article deals particularly with the so-called "660 watt rule" and with the provisions for correct fusing. Particularly is attention drawn to the new rule—section 807-C. This article should be read by every one who is in any way connected with electrical construction and installation.

OF the many changes which will appear in the 1923 edition of the Code the one which may be considered most important and the one which, at least, has had the most publicity is that relating to fusing of branch circuits. In the old Code this at times has been referred to as "the 660-watt rule."

For the purpose of the new rule the terms "branch circuits" and "outlets" are defined as follows: "Branch Circuit" is that portion of a wiring system extending beyond the final set of fuses or circuit breaker protecting it. Points on which current is taken to supply fixtures, lamps, heaters, motors and current consuming devices generally are designated as "outlets." The new rule for fusing of branch circuits is as follows:

*807b. By permission of the inspection department, on systems having a grounded neutral or having one side grounded, and where the grounded conductor is identified and properly connected, two-wire branch circuits may be protected by a fuse in the ungrounded wire, no fuse being placed in the grounded wire. Otherwise, two-wire branch circuits shall be protected by a fuse in each wire.

807c. Three-wire branch circuits may be run from direct current or single phase alternating current systems having a grounded neutral, in which case the neutrals of the branch circuits shall not be interconnected except at the center of distribution.

807d. Branch circuits in general, and except as described below, shall be protected by fuses of no greater rated capacity than—

15 amperes.....at 125 volts or less
10 amperes.....at 126 to 250 volts.

807e. Fixture wire or flexible cord of No. 18 or No. 16 gage shall be considered as properly protected by 15-ampere fuses.

Receptacles for attachment plugs (convenience outlets) are strongly recommended in order to facilitate the use of electrical appliances which, otherwise, must be connected to sockets designed primarily only as lampholders.

807f. On a two-wire branch circuit and on either side of a three-wire branch circuit, the number of outlets shall not exceed twelve (12) except by permission of the inspection department.

807g. Branch circuits supplying only sockets or receptacles of the mogul type shall have the wires protected by fuses having a rated capacity not greater than

40 amperes, at 125 volts or less.
20 amperes, at 126 to 250 volts.

807h. If protected by 40 or 20-ampere fuses as above, wire not smaller than No. 12 shall be used for wiring fixtures with mogul sockets and receptacles and may also be used for taps not over 18 inches long from the circuit wires to the points of suspension of the fixtures.

807i. The number of mogul sockets on a two-wire branch circuit and on either side of a three-wire branch circuit shall not exceed eight (8), except by permission of the inspection department.

*Section numbers as assigned to rules in this article are the same, in all probability, as they will appear in the new Code.

Identification of Neutral Wire

Section 807b specifies the conditions under which the fuse may be omitted in the grounded conductor of a two-wire branch circuit. One of these conditions is that the grounded conductor be identified. A new rule (Section 601b) under the heading of "Conductors" will require that for conductor sizes No. 8 and smaller the neutral conductor on all three-wire circuits and one conductor on all two-wire circuits shall have a continuous identifying marker readily distinguishing it from the other conductors. For rubber-covered wire the identification shall consist of a white or natural gray covering. When one of the circuit wires is to be grounded the ground connection shall be made to this identified wire. This rule will prohibit using the identified wire for all conductors of a circuit as is being done very largely at the present time.

In existing installations made previous to the time when this rule goes into effect the neutral will not have this continuous identifying marker; therefore it will not be permissible to substitute single-pole protection for that now required for each wire of two-wire branch circuits in such installations. Nor will it be permissible to provide only single-pole protection on additional branch circuits in which the approved identified wire is installed unless such proper identification is continued on through all circuits supplying these branch circuits and all other grounding requirements are complied with.

In installations of such size that feeders and sub-feeders are larger than No. 8 it will be necessary to identify neutral conductors of these feeder circuits in some manner. In open work it may be by location with reference to other wires, as the center wire of a three-wire feeder circuit. In other cases after tracing or testing out, the neutral may be identified by labeling in a suitable manner.

Ground Connections

Another condition which must exist if the fuse is to be omitted in the grounded conductor of a two-wire branch circuit is that the grounded conductor be properly connected. A discussion of the subject of grounding would require too much space for this article. Therefore it will be assumed that the grounding has been properly done in this case. Then the grounded conductor will be properly connected if compliance is made with the new rule which states that the connection with the ground on alternating current systems shall be made at each service before being connected to the power company's distribution line: provided, however, that by permission of the inspection department the connection may be made at or near the transformer, or transformers or by connection to a system ground wire. The term "system ground wire" as used here does not refer to the interior wiring system but to the outside distribution system. In some localities reliable grounds are so difficult to obtain that ground wires are carried on pole lines to a place where a satisfactory ground is obtainable. This is called a system ground wire.

It will be noted that in the rule just referred to as well as in Section 807b reference is made to "permission of the inspection department." In the application of this condition to these particular rules it is not intended or expected that each case will be treated individually. It is the belief that inspection departments will be governed by local practices and conditions and issue blanket permission accordingly. For example, in one city underground services only might meet requirements. In another the distribution system of one power company might be installed so as to obtain this approval while others did not; and in another locality the practice of a serving company might be such that the permission could be granted only on certain portions of its system.

From the preceding it is evident that no one should apply this provision of the Code without first having determined definitely that it is permissible in the particular location where the installation is to be made.

Section 807c changes a part of the old rule 23d so as to permit running of three-wire branch circuits supplying lamp sockets. Attention is directed to the requirement that the neutrals of such circuits shall not be interconnected except at the center of distribution.

Outlets per Circuit

Section 807d appears very simple as it stands but the subject matter contained therein, without a doubt, has caused more discussion than any other one rule of the Code, and the new rule presents one of the most radical changes that will appear in the 1923 edition. In the new rule no reference whatever is made to "watts," but the circuit limitation is expressed in amperes, the figures given denoting maximum capacity of fuses permissible.

Obviously a circuit protected by 15-ampere fuses at 125 volts has a capacity greater than 660 watts and one protected by 10-ampere fuses at 250 volts a still greater capacity. But while the capacity has been increased there has been specified a limit of 12 outlets per circuit (Section 807f). This decreased number of outlets will tend to hold down the circuit load to a certain extent. Attention is called also to the fine print note under Section 807e in which convenience outlets are strongly recommended. This is done for the reason that the Code in this and other rules anticipates the connection of small portable electrical appliances to lighting circuits. In the past they have been so connected and because many of them have a power consumption which very nearly approaches the 660-watt limit it has been practically impossible to restrict fuses to the limit set by the 660-watt rule if continuity of operation was to be maintained. Almost invariably circuits have been fused above the prescribed limit and quite frequently shunted out altogether. It is hoped that the larger fuse capacity allowed under the new rule will obviate this condition.

Identifying Colors for Fuses

It is possible that at some future time a new classification for cutout bases will be made so that one will be required which will accommodate fuses of no greater capacity than 15 amperes. For the present, however, the new Code will go no farther than to prescribe a means of readily identifying fuses of 15 amperes capacity or less from other fuses. On cartridge fuses the paper label will be red for 600-volt fuses, navy blue for 250-volt fuses of 15 amperes or less capacity and green for 250-volt fuses of over 15 amperes capacity. Plug fuses of 15 amperes capacity or less will be distinguished from those of larger capacity as follows: by an hexagonal shaped recess in the top of fuses having porcelain or moulded composition tops, and when labels are used with such plug fuses the labels will also be hexagonal in shape and fill the recess; or on plugs having solid metal caps, by an hexagonal impression either raised or lowered on the caps.

Mogul Sockets

Sections 807g, h and i replace the old rule which limits circuits supplying sockets or receptacles of the mogul type to 4,000 watts. The new rule, by placing the limit where it does on ampere capacity, really increases the circuit capacity but limits the number of outlets to eight.

In addition to circuit capacity limitation due to maximum number of outlets specified in Sections 807f and 807i of the Code there are other limiting factors in some cases. In a number of cities the municipal inspection departments have very definite requirements specifying minimum capacities to be assigned to certain outlets according to location and purpose for which they are to be installed.

A shipment of the new code books will be made from the East within a few days. Copies will, therefore, be available, barring unforeseen delays, about Nov. 1, and may be obtained on application to the Board of Fire Underwriters of the Pacific, Merchants' Exchange Building, San Francisco.

The COAST Outlet
ELECTRICAL CONSTRUCTIONISTS' and DEALERS' NEWS

Electrical Construction

By E. Earl Browne

IN the past building owners have suffered considerable loss and tenants have been seriously inconvenienced by the failure to make adequate advance provision for telephones and private call bell circuits. Frequently a great deal of damage to the property has resulted from subsequent installation of these devices and nearly always it has been impossible to conceal the wiring so that a neat and satisfactory job could be had. In addition to these features it has been found that the cost of installation, where provision had not been initially made, has frequently been so high as to be prohibitive.

Provision for public telephones and messenger call is best made by using either a portion of the riser closet, as per Figs. 1 and 2 which appeared on pages 254 and 255 of the Oct. 1 issue of the Journal of Electricity, or separate closets for these two services. The cables can then be run, as service is required, from the basement to cabinets and connecting

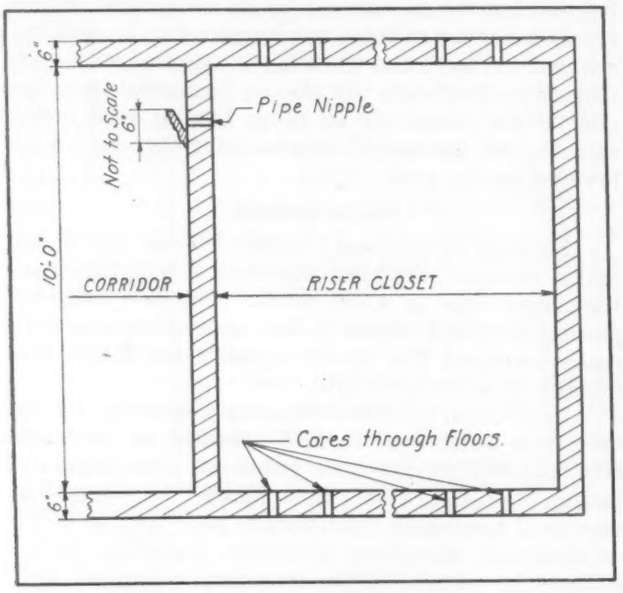


Fig. 1—Signal and telephone closet with sleeves through floors for risers and cross connection of floors, also sleeves for the running of telephone wires in deep moulding.

strips or racks. The corridor usually has a deep wooden moulding run on both sides, as per Figs. 1 and 2, herewith, and as will be noted in Fig. 1, sleeves are installed in walls from closets to mould and also from each room to the corridor moulding. From the moulding in each room one or more ½-in. conduits are installed from the moulding line to an outlet in the base board, as is shown in Fig. 3. As desks are usually arranged near the windows an outlet on each side wall near the front would probably provide for

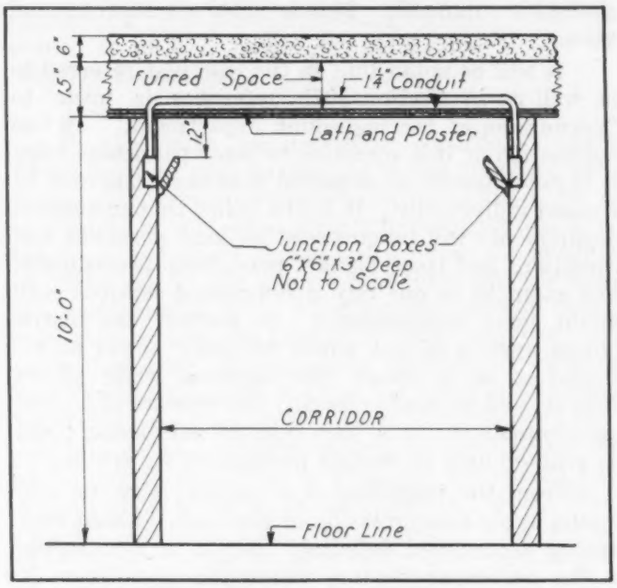


Fig. 2—Showing method of crossing corridor with conduit for telephones and other signals.

service with a minimum of exposed wiring. There has recently been developed a line of hollow moulding which is made an integral part of base boards and door casings and has a removable cap for placing or changing of wires and does away with any necessity for unsightly exposed wires, but as this is rather expensive it is cheaper to provide for this service as above outlined.

In office buildings designed for suite rental in large groups or with few partitions the problems of bell and buzzer signals, which in most cases cannot be predetermined in advance of the general construction, can best be served by a network of empty conduits with an outlet on each column and four outlets equally spaced in the floor of each bay as per Fig. 4. As to the size conduit to run from the terminal cabinet in the closet to a group of outlets, it is generally safe to figure that not more than six calls will be required per bay which means that even

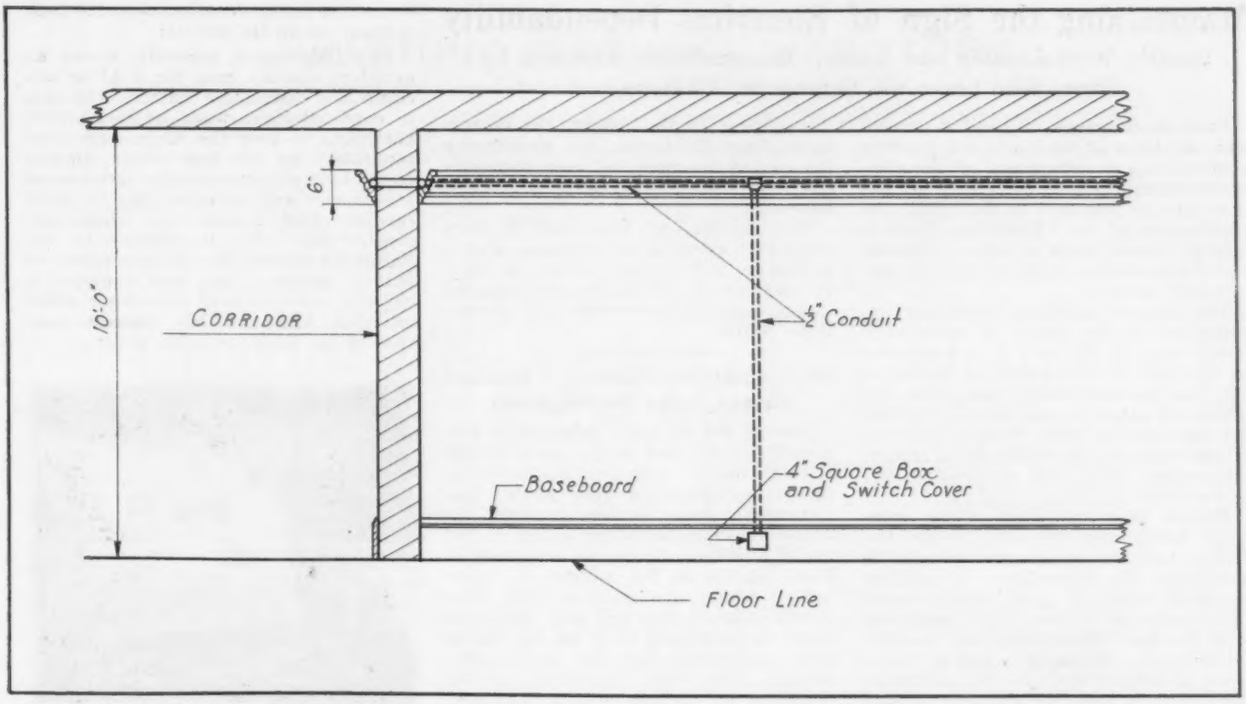


Fig. 3—Method of supplying public telephone service by means of raceways of picture moulding with sleeves through walls and conduits down partitions.

a return call system with two individual wires and the common battery lead would total but thirteen wires. Where the calls are one way the total would be seven wires per bay. The following table shows the number of No. 18 light insulated fixture wires in combination with a battery wire of No. 14 S. B. solid R. C. wire which can be installed in various size conduit on a basis of 40 per cent of the area of the conduit:

½"— (7) and (1) No. 14 Battery Lead
¾"—(16) and (1) No. 14 Battery Lead
1"—(28) and (1) No. 14 Battery Lead
1¼"—(50) and (1) No. 14 Battery Lead

In cases where there is a straight piece of conduit or one with not over one bend the following number can be installed:

½"—(12) and (1) No. 14 Battery Lead
¾"—(25) and (1) No. 14 Battery Lead
1"—(45) and (1) No. 14 Battery Lead

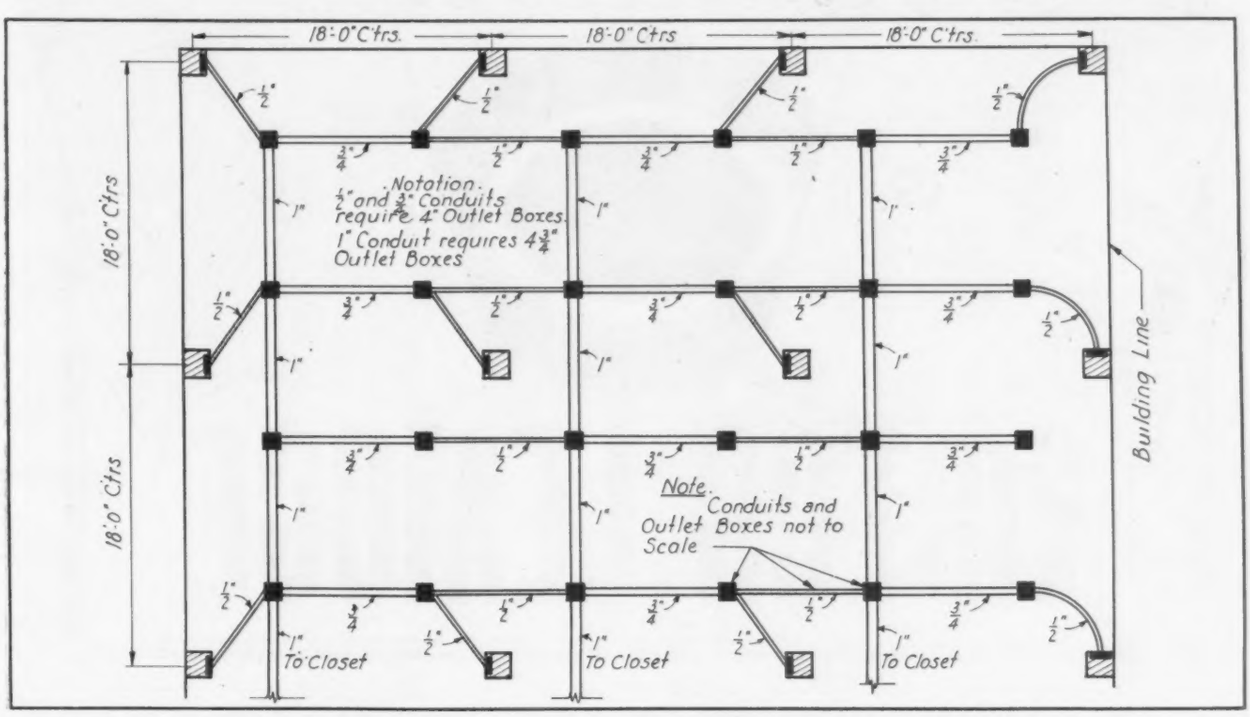


Fig. 4—Conduit network for buildings to be occupied by concerns requiring an intricate signal system.

Maintaining the Sign of Electrical Dependability

Quality Workmanship and Fullest Responsibility Assumed by Firms Who Show the Symbol on All Occasions

Each week brings to hand more and more evidence of the continued growing popularity and enthusiasm of the electrical constructionists and dealers in the campaign to put over to the public the significance of the "Electrical Dependability" trade mark of the California State Association of Electrical Contractors and Dealers.

The biggest difficulty heretofore encountered by the dealer in doing electrical work, is the lack of appreciation on the part of the public of having a job done so completely, that when finished and placed in operation they can depend upon its giving them in the way of operation and performance of duties, that which they had anticipated and wished for.

Efforts since the start of the campaign have been not only to get the dealer, but the public particularly, to appreciate the importance of getting electrical work of such completeness that they can place their confidence in it to meet immediate and possible future needs. Hence the mark of "Electrical Dependability" and the campaign back of it to keep the public reminded of the necessity for better and more complete jobs.

Assisting in this effort, the dealers throughout California are introducing the slogan in many of their publicity channels, some ways being illustrated herewith.

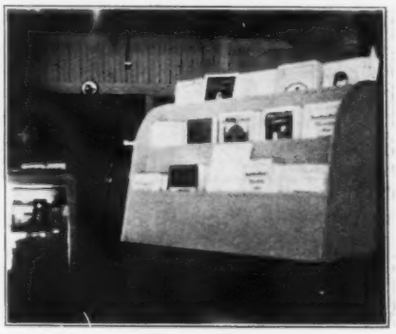
The Journal of Electricity is very much interested in the progress of this campaign and invites dealers to send in samples of all matter bearing the slogan used in furthering this promotional work.

Neat Case for Holding Circulars Brings Sales Development

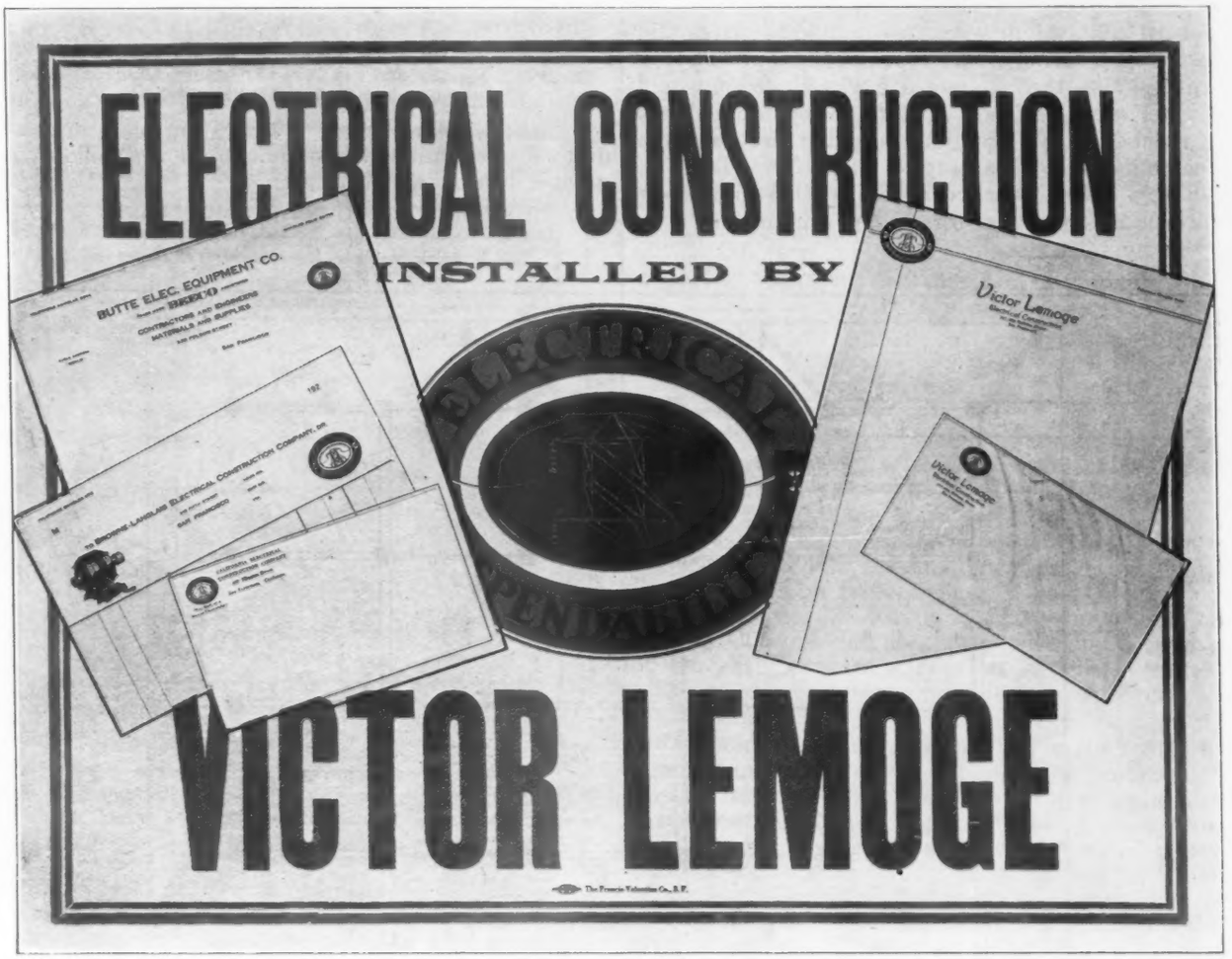
One of the valuable sales helps furnished without cost to the dealer is the circular matter prepared by manufacturers descriptive of their goods. Unfortunately many dealers overlook the value of such material and either do not use it at all or display it carelessly in loose bundles on the counter.

Live dealers are realizing that these circulars are a real help and that they carry in condensed form all the major sales arguments for the device concerned. They are, therefore, making provision for the neat display and adequate use of such material and are providing a proper container which they keep at a handy location near the cash register or on the counter.

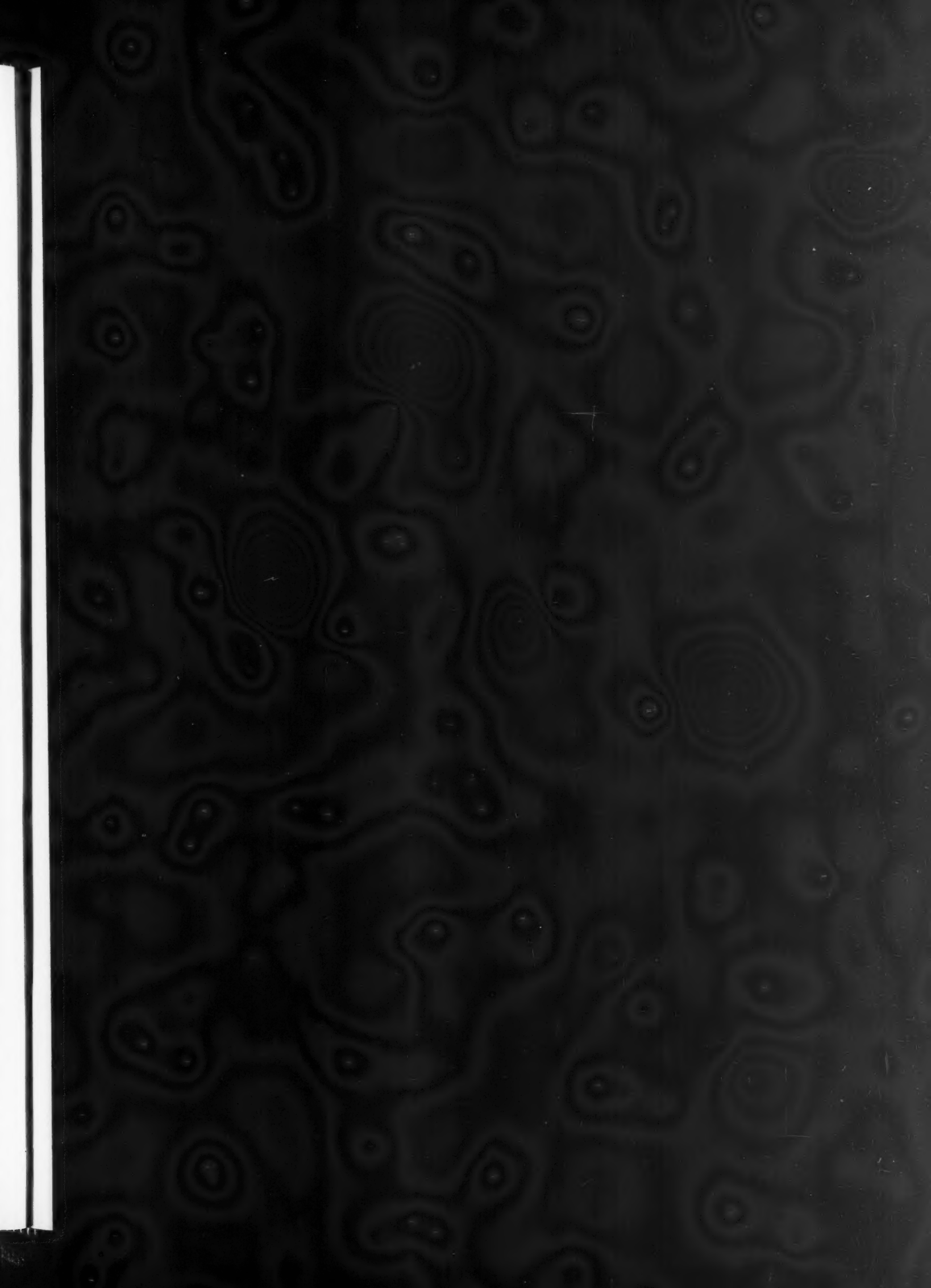
The illustration herewith shows an excellent display case for holding circulars and descriptive matter. The case is made of light wood or metal with partitions to keep the various circulars separate. As the case slants slightly to the rear all circulars are given equal prominence and selection may be made readily. Such a case kept where customers may help themselves to the literature therein is of assistance in that a customer may see displayed a circular descriptive of something which interests him and his interest may thereby be developed into a sale.



An attractive case for displaying circulars.



The sign of "Electrical Dedependability" is used by the members of the California State Association of Electrical Contractors and Dealers on every occasion. This photograph shows some of the means employed to give publicity to the symbol and slogan.



WASHING MACHINE DIRECTORY

Published and Copyrighted by the Journal of Electricity, October 15, 1923

A list of washing machine manufacturers giving catalog information on the equipment of each, with complete list of Western Distributing Agencies where repair parts may be secured. The publisher does not guarantee this information, but to the best of our knowledge it is correct at date of publication. When referring to this list in any way, mention the **Journal of Electricity.**

Key to Abbreviations

O—oscillating type
VC—vacuum cup type
Cl—cylinder type
D—dolly type
Im—impeller type
DFM—Dayton Fan & Motor Co.
Wx—Westinghouse
GE—General Electric
RM—Robbins & Myers
Em—Emerson
Dom—Domestic
Cen—Century
L—Lovell
W—wood
M—metal
Sw—swinging
St—stationary
An—Anchor
Am—American
C—copper
TC—tinned copper
Cz—copper, zinc lined
GI—galvanized iron
Z—zinc
VM—various models

Manufacturer	Trade Name	Operation	Motor		Wringer		Tub			Retail Price		Western Sales Representative	Western Distributor	Nearest Point At Which Repair Parts May Be Obtained.
			Horse Power	Maker	Type	Length in Inches	Dimensions	Capacity (Sheets)	Material	Eastern	West of Rockies			
Almetal Mfg. Co., St. Louis, Mo.	"Almetal" "Pollyanna"	VC O	1/4 1/4	GE GE	W W	11 11	19x18 26x17	6 7	C C	$135 $120	$145 $130	.....	**W. C. Bailess,** 531 W. 8th St., Los Angeles	Distributor.
Altorfer Bros. Co., Peoria, Ill.	"A. B. C."	Cl O D	1/4 1/6 1/4	RM	M M W	12 12 11	22x24	6	W or Z	$145	$155	**W. E. Peters,** 89 E. 12th St., Portland	**A. A. Wilson,** 612 S. Spring St., Los Angeles **E. W. Murray Ltg. Co.,** Spokane **Richter Sales Co.,** Seattle **Electric Service Co.,** Portland	Distributors.
Apex Appliance Co., 3223 W. 30th St., Chicago, Ill.	"Apex"	O O	1/6 1/4	GE RM Wx Wx	M M	11 12	....	6–9 16	TC TC	....	....	**A. M. Smith Co.,** Los Angeles	Dealers	Dealers
Apex Elec. Mfg. Co., The 1067 E. 152nd St., Cleveland, Ohio	"Rotarex"	Cl	1/4	Own	M	12	17x18	8	G C	$152.50 $167.50	$157.50 $172.50	**G. A. Buckley,** 1405 Walnut St., Kansas City, Mo.	**The Apex Elecl. Distrib. Co.,** 681 Market St., San Francisco 1437 Welton St., Denver 2117 Inyo St., Fresno **North Coast Electric Co.,** Portland, Seattle, Tacoma, Spokane **Electrical Equipt. Co.,** Butte **Illinois Elec. Co.,** Los Angeles **Inter-Mountain Elec. Co.,** Salt Lake City	Distributors
Automatic Elec. Washer Co., Newton, Iowa	"Automatic"	D	1/4	Wx Em	W or M	12	.....	6	C or W	$107	$117	**Inter Mountain Elect. Co.,** Salt Lake City and Direct Salesmen	**Domestic Elec. Appl. Co.,** Seattle **Inter Mountain Elec. Co.,** Salt Lake City and Direct Salesmen	Salt Lake City
Barlow & Seelig Mfg. Co., Ripon, Wis.	"Big 3"	VC	1/6 and 1/4	Em	W	11 and 12	.....	4 to 8	C	VM $90 to $150	VM $100 to $165	**Dohrman Commercial Co.,** San Francisco	**Dohrman Commercial Co.,** San Francisco	Distributor
Buckeye Prima Co., The Sidney, Ohio	"Prima"	O	1/4	GE	M	12	.....	8	W	$160	.....	**H. R. Christy,** 322 Leary Bldg., Seattle	**H. R. Christy,** 322 Leary Bldg., Seattle	Distributor
Chicago Dryer Co., 2210-20 N. Crawford Ave., Chicago, Ill.	"Chicago"	O	1/4	Em	M	12 and 14	26x18 26x21 26x24	9 12 15	Cz	$200 to $375 VM	.....	.....	**M. E. Hammond,** Pacific Bldg., San Francisco **S. W. R. Daily,** Seattle **Maritzen-Kuns Co.,** Los Angeles	Distributors
Clarinda Mfg. Co., Clarinda, Iowa	"Clarinda"	D	1/4	GE	W	10	22x22	6	W	$80	$90	**Thos. T. Hoffmire,** 178 W. 41st Place, Los Angeles		
Clark Cadle Harmon Corp., Rochester, N. Y.	"Harmony"	Cl	1/4	Wx	L	11	18½x19	8	W	.....	.....	**Rawling & Smith.** 604 Mission St., San Francisco	**Dunham, Carrigan & Hayden Co.,** San Francisco	San Francisco
Coffield Washer Co., The Dayton, Ohio	"Coffield"	O	1/4	Sp	Sw	12	22x22	8	TC	$155	$160	**E. P. Becker,** 111 E. 3rd St., Los Angeles	**Woodill-Hulse Elec. Co.,** 111 E. 3rd St., Los Angeles **Honeyman Hardware,** Portland **Northwest Washer Co.,** Seattle	Distributors
Conlon Corporation, 52nd Ave. and 19th St., Chicago, Ill.	"Incomparable Conlon"	Cl	1/4	GE	M	12	23x22	6	C GI	$180 $170	.....	**Woodill-Hulse Elec. Co.,** Los Angeles		Distributor
Davis Sewing Mch. Co., The Dayton, Ohio	"Blue Bird"	O	1/6	GE Wx	Sw	11	16¾x27	8	C	$160	$160	**C. A. Eastman,** 213 Corbett Bldg., Portland	**Blue Bird Appliance Co.,** 1007–1st Ave., Seattle **Alexander & Lavenson,** San Francisco **K. P. Loop,** McMinnville, Ore.	San Francisco
Dawn Mfg. Co., The Bridgeport, Conn.	"Dawn"	VC	1/6	GE	Am	12	.....	6	.....	.....	$79	**Frederic A. Clarke** 351 Oak St., Glendale, Cal.		336 S. Broadway, Los Angeles
Delco-Light Company, Dayton, Ohio	"Delco-Light"	O	1/6	DL	M	11	22x22	8	C	.....	$160	.....	**W. L. Cochran, Inc.,** 880 Mission St., San Francisco **Ivan L. de Jongh,** 129 E. 6th St., Los Angeles **Modern Appliance Co.,** 508–1st Ave., South, Seattle	Distributors
Federal Electric Co., 8700 S. State St., Chicago, Ill.	"Federal"	O	1/4	Wx	L	....	32x27	6	C GI	$175	$175	**Federal Electric Co.,** 91 New Montgomery St., San Francisco	Jobbers	Jobbing Points
Foote-Burt Co., The Cleveland, Ohio	"Aerobell"	VC	1/4	GE RM	M	....	18½x24	8	C	$165	$175	.....	**Commercial Associates,** Los Angeles **Barker Bros.,** Los Angeles	Los Angeles
Fosston Mfg. Co., St. Paul, Minn.	"Pal-O-Mine" "New Liberty"	O Cl	1/6 1/4	Wx Wx	St Sw	....	....	6 8	C W	$125 $145	....	**Pryser & Herman,** 815 Union League Bldg., Los Angeles	**Western Agencies, Inc.,** San Francisco	San Francisco
General Railway Signal Co., Rochester, N. Y.	"G-R-S"	Cl	1/4	Own	Sw	12	.....	8 to 18	C GI	$140 to $210	.....	.....	**Mangrum & Otter Inc.,** 827 Mission St., San Francisco	Rochester, N. Y.
Getz Power Washer Co., Morton, Ill.	"American Beauty"	O	1/4	Wx	M	11	.....	6 8	C C	$125 $155	$135 $165	**Getz Washer Sales Co.,** 910 S. Grand Ave., Los Angeles	.....	Los Angeles
Geyser Electric Co., 5008 Bloomingdale Ave., Chicago, Ill.	"Geyser"	Cl	1/4	Em Dom	L	11	.....	3 to 9	C GI	$75 to $175	$85 to $185	**Ion Arnold,** Westminster Hotel, Los Angeles	.....	Chicago, Ill.

WASHING MACHINE DIRECTORY
(CONTINUED)

Key to Abbreviations
O—oscillating type
VC—vacuum cup type
Cl—cylinder type
D—dolly type
Im—impeller type
DFM—Dayton Fan & Motor Co.
Wx—Westinghouse
GE—General Electric
RM—Robbins & Myers
Em—Emerson
Dom—Domestic
Cen—Century
L—Lovell
W—wood
M—metal
Sw—swinging
St—stationary
An—Anchor
Am—American
C—copper
TC—tinned copper
Cz—copper, zinc lined
GI—galvanized iron
Z—zinc
NP—Nickel Plated
VM—various models

Manufacturer	Trade Name	Operation	Motor		Wringer		Tub			Retail Price		Western Sales Representative	Western Distributor	Nearest Point At Which Repair Parts May Be Obtained.
			Horse Power	Maker	Type	Length in Inches	Dimensions	Capacity (Sheets)	Material	Eastern	West of Rockies			
Haag Bros. Co., Peoria, Ill.	"Haag"	D Cl O	1/4	GE RM Em	W	12	.....	6 6 7	W	$86 to $145	.....	**F. H. McGinnis,** 906 "J" St., Sacramento	**F. H. McGinnis,** Sacramento, Cal. **A. M. Smith Co.,** Los Angeles	Sacramento, Cal.
Horton Mfg. Co., Fort Wayne, Ind.	"Horton"	VC D VC	1/4 1/6 1/4	GE GE GE	M M M	12 10 12	18x25 18x25	8 6 8	C W VE	$160 $80 $165	.....		**Baker Hamilton & Pacific Co.,** San Francisco **A. A. Wilson,** Los Angeles **Schwabacher Hdwe Co.,** Seattle **Hexter & Co.,** Portland **Salt Lake Hdwe Co.,** Salt Lake City **Holly Mason Hdwe Co.,** Spokane **Tritch Hardware Co.,** Denver	Distributors
Hurley Machine Co., 22nd St. & 54th Ave., Chicago, Ill.	"Hurley Thor"	CL	1/6 1/4	GE Wx	M	11 12	.....	6 to 12	C or GI or W	$125 to $275	$135 to $280	**Hurley Machine Co.** **J. W. Ferry,** 425 Rialto Bldg., San Francisco	**Pacific States Electric Co.,** San Francisco, Los Angeles, Oakland, Portland, Seattle, and Spokane	All branches of distributor
	"Hurley Superior"	O D	1/6 1/4	GE Wx	M or W	11 12	.....	6	C or GI or W	$84 to $145	$145 to $155			
Johnson Elec. Washer Co., 40th & Adeline Sts., Oakland, Cal.	"Johnson Impeller"	Im	1/4	Wx	Sw	11	16x22	6	C	.....	$150	**Johnson Elec. Washer Co.,** 40th & Adeline Sts., Oakland, Cal.	Same	Factory
	"Johnson"	Im	1/6	Wx	St	11	16x22	6	C	.....	$110			
	"Johnson"	D	1/6	Wx	St	11	16x22	6	C	.....	$100			
Landers Frary & Clark, New Britain, Conn.	"Universal"	Cl	1/4	RM Wx	W	12	.....	6	GI C	.....	$150 $165	**C. K. E. Watson** Call Bldg., San Francisco	**Electric Appliance Co.,** San Francisco, Los Angeles **Baker Hamilton & Pacific Co.,** San Francisco **Schwabacher Hdwe. Co.,** Seattle **Electric Corporation,** Los Angeles	San Francisco and Los Angeles
	"Whirlwave"	O	1/4	Wx	....	12	18x26	8	C	$135	$150			
Maytag Co., The Newton, Iowa	"Maytag"	Cl	1/4	GE	Sw	12	22x22	6	A	$150	$160	**Chas. H. Long,** 315 Belmont, Portland	**Schlueter's,** Los Angeles, San Francisco **Holly-Mason Hdwe Co.,** Spokane **The Salt Lake Hdwe Co.,** Salt Lake City **Sloat Wholesale Co.,** Portland **Southern Electrical Co.,** San Diego **Stewart Wholesale Co.,** Boise, Idaho **West Coast Sales Co.,** Oakland	Representative or Distributors
Meadows Mfg. Co., Bloomington, Ill.	"Meadow Lark"	Cl	1/4	RM and	M	11	18x20	6	GI C	$135 $155	$145 $165	**L. A. Robinson,** 1160 Orange Grove Ave., Los Angeles	**Manufacturers Representatives Co.,** San Francisco and Los Angeles **Fobes Supply Co.,** Portland, Seattle **Capital Elec. Co.,** Salt Lake City **Mine & Smelter Supply Co.,** Denver **Butte Elec. Supply Co.,** Butte	All Jobber Representatives
	"Greyhound"	O	1/4	GE	M	11	18x28	8	C	$150	$160			
	"Master Washer"	Cl	1/4		M	11	18x20	6	GI	.....	.....			
Michigan Washing Mch. Co., Muskegon, Mich.	"Michigan Electric"	D	1/4	GE	W	10	.....	6	W	$85	$85	.....	**Heyman Weil Co.,** San Francisco **Union Hdwe. & Metal Co.,** Los Angeles	San Francisco and Los Angeles
	"Electric Lady"	O	1/4	GE	W	12	.....	12	C	$150	$150			
Modern Laundry Mch. Co., Kansas City, Mo.	"Mola"	Cl	1/4	.....	W	12	.....	.....	.....	$130	$135	**Geo. E. Prine,** care of A. A. Wilson, 606 S. Spring St., Los Angeles	**A. A. Wilson,** 606 S. Spring St., Los Angeles	Los Angeles
New Era Elec. Corp., Hoboken Terminal "D," Hoboken, N. J.	"Modern Home Washer"	Cl	1/8	GE	An	12	19½x19½	6	GI	$119	$127.50	**H. R. Basford Co.,** San Francisco	.....	San Francisco
One Minute Mfg. Co., Newton, Iowa	"One Minute"	Cl	1/3	Dom	Sw	12	.....	6	C	$145	$152	**A. J. Ratelle,** 619 Pine St., Seattle	**Dohrman Commercial Co.,** Parmelee-Dohrman Co., Los Angeles	San Francisco
		D	1/4	Dom	Sw	12		6	W	$99	$106.50			
Puffer-Hubbard Mfg. Co., 2601-32nd Ave., S., Minneapolis, Minn.	"Daylight"	VC	....	Em	W M	12 12	.....	.....	C W	$155	$165	**Puffer-Hubbard Mfg. Co.,** 207 Railway Exchange, Portland	.....	.....
Sunbeam Elec. Mfg. Co., Evansville, Ind.	"Sunbeam"	O	1/6	Wx	M	12	19x23	8 6 18	C	$155 $129.50 $215	$162.50	**F. M. Hills,** 516 Bancroft Blvd., San Diego	.....	San Francisco
Sunny Line Appliances, Inc., 4058 Beaufait Ave., Detroit, Mich.	"Sunnysuds"	O	1/4	Dom	M	12	.....	.....	C	$125	$135	.....	**Commercial Associates, Inc.,** 754 N. Spring St., Los Angeles **Poole Elec. Co.,** 1206-4th Ave., Seattle	.....
Syracuse Washing Mch. Corp., Syracuse, N. Y.	"Easy Vacuum Elec. Washer"	VC	1/6	GE RM	M	12	.....	8	C GI NP	$155 $125 $139	$165 $135 $149	**J. Lee Richards,** **Syracuse Washing Mch. Sales Co.,** 180 New Montgomery St., San Francisco	.....	San Francisco
The "1900" Washer Co., Binghamton, N. Y.	"Cataraction"	O	1/4	RM	Sw	....	.....	8	....	$155	$165	**W. Lee Holmes,** 71 New Montgomery St., San Francisco	.....	.....
Western Electric Co., New York City	"Western Electric"	Cl	1/6	Own	Sw	11¾	22x23	6	GI TC	$125 $145 $155 $175	$135 $155 $165 $185	**Western Electric Co.,** San Francisco, Los Angeles, Oakland, Seattle, Tacoma, Portland, Spokane, Denver, Salt Lake City	**Western Electric Co.,** San Francisco, Los Angeles, Oakland, Seattle, Tacoma, Portland, Spokane, Denver, Salt Lake City	All Branch Offices
White Lily Mfg. Co., Davenport, Iowa	"White Lily DeLuxe"	Cl	1/4	GE	....	....	.....	6	GI C	.....	.....	**H. J. Valentine,** 488 N. Cypress, Burbank, Cal.	.....	Factory
H. E. Williamson Co., 22 Grace St., San Francisco	"California Maid"	Cl	1/6	Cen	Sw	11	18x26	8	GI	.....	$125	**H. E. Williamson Co.,** San Francisco	.....	San Francisco
Woodrow Mfg. Co., Newton, Iowa	"Woodrow"	D	1/6	Em	Sw	12	.....	6	W	$102	$110	.....	**W. E. Dooley & Co.,** 804 Pine St., Seattle **A. A. Wilson,** 712 S. Spring St., Los Angeles	Distributors

ELECTRIC IRONER DIRECTORY

Published and Copyrighted by the Journal of Electricity, October 15, 1923

A list of Electric Ironer Manufacturers giving catalog information on the equipment of each, with complete list of Western Distributing Agencies where repair parts may be secured. The publisher does not guarantee this information, but to the best of his knowledge it is correct at the date of publication. When referring to this list in any way, mention the **Journal of Electricity.**

Key to Abbreviations

E—electric heat
G—gas heat
Gn—gasoline heat
Wx—Westinghouse
GE—General Electric
R&M—Robbins & Myers
Dom—Domestic
WE—Western Electric
B—belt drive
G—gear drive
FC—foot control
HC—hand control
A—automatic
VM—various models

Manufacturer	Trade Name	Shipping Weight (lbs.)	Dimensions (floor space)	Length of Rolls (in.)	Heat for Rolls	Wattage for Rolls	Motor: Make	Motor: H. P.	Drive	Control	Speeds	Price: East	Price: West of Rockies	Western Sales Representative	Western Distributors	Nearest Point At Which Repair Parts May Be Obtained.
Altorter Bros. Co. Peoria, Illinois	"A. B. C."	291 355	33x25	26 44	E G E G	1350 2700	Wx Wx	1/6 1/6	B B	FC FC	....	$145 $125 $200 $165	$155 $135 $210 $175	**W. E. Peters** 89 E. 12th St., Portland	**A. A. Wilson** 612 S. Spring St., Los Angeles **E. W. Murray Lighting Co.** 313 Riverside Ave., Spokane **Richter Sales Co.** 310 Stewart St., Seattle **The Electric Service Co.** 175 Park St., Portland	Western Distributors
American Ironing Machine Co. 844 W. Adams St., Chicago, Ill.	"Simplex"	VM	VM	26 to 56	E G Gn	VM	....	....	B	HC	1 and 2	VM	VM	**H. R. Basford Co.** 180 New Montgomery St., San Francisco	**H. R. Basford Co.** San Francisco **Fobes Supply Co.** Portland, Seattle **Woodill-Hulse Elec. Co.** 111 E. 3rd St., Los Angeles	San Francisco
Apex Appliance Co. 3223 W. 30th St., Chicago, Ill.	"Apex"	511 526	26x54	44 48	E G Gn	3200	GE R&M Wx	1/6	G	FC	....	$160	$170	**A. M. Smith Co.,** 219 W. 3rd St., Los Angeles	**A. M. Smith Co.,** 219 W. 3rd St., Los Angeles	Los Angeles
Apex Elecl. Distribg. Co. 1067 E. 152nd St., Cleveland, Ohio	"Rotarex"	325	22x60	46	E G	3000	Own	1/6	B	FC	1		$152.50 (Cash) $167.50 (Time)	**G. A. Buckley** 1405 Walnut St., Kansas City, Mo.	**Apex Elecl. Distrib. Co.** 681 Market St., San Francisco 1437 Welton St., Denver 2011 Broadway, Oakland 1024–11th St., Sacramento 2117 Inyo St., Fresno **Illinois Elec. Co.** Los Angeles **North Coast Elec. Co.** Portland and Seattle **Electrical Equip. Co.** Butte, Montana **Intermountain Elec. Co.** Salt Lake City	Western Distributors
Barnett Foundry & Machine Co. Irvington, N. J.	"Capitol"	470	60x24	46	E G Gn	2700	....	1/6	B	FC	....	$155	$170	.....	.....	Factory
Deming Mfg. Co. 5005 Euclid Ave., Cleveland, Ohio	"Deming"	250	57x24	46	E G	2400	Ohio	1/8	B	HC	....	$160 $117.50	.....	.....	.....	.....
Hollandmaid Co. Holland, Mich.	"Hollandmaid"	280	57x24	48	E G	....	GE	1/6	G	FC	....	$150	$160	.....	.....	Factory
Horton Mfg. Co. Fort Wayne, Ind.	"Horton"	320	22x42	30	E G	2000	GE	1/6	B	FC	....	$140	.....	.....	**A. A. Wilson** Los Angeles **Salt Lake Hdwe Co.** Salt Lake City **Hexter & Co.** Portland **Schwabacher Hdwe Co.** Seattle **Holley-Mason Hdwe Co.** Spokane	Factory
Hurley Machine Co. Chicago, Ill.	"Thor Automatic"	565	54x25	44 or 50	E G Gn	1500	GE or Wx	1/6	G	A	2	$165	$180	**J. W. Ferry** 425 Rialto Bldg., San Francisco	**Pacific States Elec. Co.** SanFrancisco, Oakland, Seattle, Portland, Los Angeles and Spokane	Western Distributors
The "1900" Washer Co. Binghamton, N. Y.	"1900"	450	27x53	44	G E Gn	2500	R&M	1/10	G	FC	....	$160	$175	**W. Lee Holmes** 71 New Montgomery St., San Francisco	**W. Lee Holmes** 71 New Montgomery St., San Francisco	San Francisco
Sperlich & Uhlig Co. Detroit, Mich.	"Ironrite"	410	26x63	46	E G	3500	Dom	1/4	G	FC	....	.....	.....	.....	**Poole Electric Co.** 1206 Fourth Ave., Seattle	.....
Union Cabinet & Mac. Co. Rochester, N. Y.	"Union"	290	56x21	46	G	....	GE	1/8	G	HC	....	$160	.....	.....	.....	Factory
Utensils Co. 303 E. Columbus St., Fort Wayne, Ind.	"Utenco"	310	24x42	24	E G Gn	2750	GE	1/6	G	FC A	....	$175 $155 $165	.....	**Kenneth Wollson** 1405 S. Hill St., Los Angeles	**Listenwalter & Gough** Los Angeles **West Coast Sales Co.** Oakland	Los Angeles or Oakland
Western Electric Co. New York City	"Western Electric"	198	37x24	28	G	....	WE	1/10	G	FC HC	....	$125	$140	**Western Electric Co.** 680 Folsom St., San Francisco	**Western Elec. Co.** San Francisco, Los Angeles, Oakland, Portland, Seattle, Tacoma, Spokane, Denver, and Salt Lake City	All Branch Offices
F. B. Zieg Mfg. Co. Fredericktown, Ohio	"Buckeye"	350	24x48	46	E G Gn	2500	GE	1/6	G	FC	....	$140	$150	.....	**W. E. Dooley & Co.** Seattle, Wash.	Seattle

ELECTRIC RADIATOR AND HEATER DIRECTORY

Published and Copyrighted by the Journal of Electricity, October 15, 1923.

A list of Electric Radiator and Heater Manufacturers giving catalog information on the equipment of each, with complete list of Western Distributing Agencies where repair parts may be secured. The publisher does not guarantee this information, but to the best of his knowledge it is correct at the date of publication. When referring to this list in any way, mention the **Journal of Electricity.**

Key to Abbreviations

B—Bronze
Br—Brass
C—Copper
Nk—Nickel
BS—Blue Steel
OI—Old Ivory
En—Enamel
Po—Portable
Pd—Pendant
St—Stationary
Fr—Fireplace
VM—Various Models

Name of Manufacturer	Trade Name	Dimensions in Inches	Reflector Dimen. (Inches)	Finish		Heating Element					Price		Western Sales Representatives	Western Distributors	Nearest Point at Which Repair Parts Can Be Secured.
				Heater	Reflector	Type	Number of Elements	Total Wattage	No. of Heats	Removable Elements	Fits Edison Socket	East	West of Rockies			
Edison Elec. Appliance Co., Ontario, California.	"Hedlite"	20x15	14	B OI En	C	Po	1	630	1	Yes	Yes	.....	$7.95 to $16.50	**Edison Elec. Appl. Co., Inc.,** Ontario, Calif. San Francisco Los Angeles Portland Seattle	All Leading Jobbers.	Ontario, Calif. San Francisco Los Angeles Portland Seattle
	(High Wattage)	VM	VM	En		Po	....	1000 to 5000	1 to 3	....	No	.....	$26.00 to $56.00			
Elec. Heatg. & Mfg. Co., Westlake & Republican Sts. Seattle, Wash.	"Circo-Flector"	15x9	9¼	C	C	Po	1	660	1	Yes	Yes	.....	$8.00	**Elec. Htg. & Mfg. Co.,** Seattle	**Eastern Mfrs. Co.,** Portland **Wholesale Electric Co.,** San Francisco **Seattle-Astoria Iron Wks.,** San Francisco	Seattle
	"100% Radiator"	.....	.....	En	....	Po	3 to 6	1200 to 8000	3 to 6	No	No	.....	$20.00 to $75.00			
Estate Stove Co., The Hamilton, Ohio	"Estate"	17x 8	9½	B	B	Po	1	660	1	Yes	No	$7.50	$8.00	**The Estate Stove Co.,** Furn. Exchge. Bldg., San Francisco	**The Estate Stove Co.,** San Francisco	Factory
Even Heat Elec. Co., 2429 Canton Ave., Detroit, Mich.	"Even Heat"	17x 9	....	En	N	Po	2	660	1	Yes	....	$9.50	.....	**Karpp Sales Co.,** 1160 Pine St., San Francisco	**Karpp Sales Co.,** San Francisco **Tacoma Mercantile Co.,** Tacoma **North West Sales Co.,** St. Paul, Minn.	St. Paul, Minn.
Fitzgerald Mfg. Co., The Winsted, Conn.	"Model C"	18x14	14	En	C	Po	1	600	1	Yes	Yes	.....	.....	**A. S. Chernoff Co.,** 41 Fell St., San Francisco		San Francisco
	"Model D"	17x12	12	En	C	Po	1	600	1	Yes	Yes	.....	.....			
A. C. Gilbert Co., The New Haven, Conn.	"Polar Cub"	13x11	11	En	C	Po	1	550	1	Yes	Yes	$5.00	$5.25	**H. E. Iblings,** 4816 Franklin Ave., Los Angeles	In all large cities.	Distributors
Haber Die & Stamping Co., Chicago, Ill.	"The Sun"	19x14	14	En	C	Po	1	575	1	Yes	Yes	$8.50	$8.85	**H. J. Gute & Co.,** San Francisco **R. M. Burton Sales Agcy.,** Alaska Bldg., Seattle **Leo Rabin,** 1516 S. Union Ave., L. A.		Sales Representatives
W. Wesley Hicks, Rialto Bldg., San Francisco	"Wesix"	VM	....	....	....	Po St. Fr	VM	800 to 6000	3	....	....	.....	.....	**W. Wesley Hicks,** Rialto Bldg., San Francisco	All Jobbers	San Francisco
Landers, Frary & Clark, New Britain, Conn.	"Universal" and "Thermax"	16x12 and 18x14	12 and 14	B	C	Po	1	625	1	Yes	Yes	$7.50 to $11.50	$7.50 to $11.50	**Landers, Frary & Clark** 335 New Call Bldg., San Francisco	**Electric Appliance Co.,** San Francisco **The Electric Corp.,** Los Angeles, Seattle, Portland **Fobes Supply Co.,** Seattle, Portland **Hdwe. Jobbers**	Universal Service Stations, San Francisco, Los Angeles, Seattle
Majestic Elec. Appl. Co., Inc., 590 Folsom St., San Francisco	"Majestic" "Radiant"	16x12	11½	En	C	Po	1	615	1	Yes	Yes	$9.50	$9.50	**Majestic Elec. Appl. Co.,** San Francisco	All Jobbers	Jobbers
		19x14	12½	En	C	Po	1	615	1	....	....	$10.50	$10.50			
		15x15	...	Nk	C	Po	2	760	1	Yes	No	$25.00	$25.00			
		19x14	12½	En	C	Po	2	960	1	....	...	$13.50	$13.50			
	"Radiant-Convection"	17x22	...	B	....	St	....	2000	3	No	No	$40.00 to $115.00	$40.00 to $115.00			
		20x25	...	Br	....	Fr	....	....	....	....	....					
		9x35	...	C	....	St	....	4000	....	....	....					
L. Pinut & Co. 432-E. 23rd St., New York City	"Double Ray"	7x8	8½	Br	C	Po	....	600	1	Yes	Yes	$8.50	$8.50	**Ralph A. Ryan** 417 Montgomery St., San Francisco	**Reiman Whsle. Elec. Co.** Los Angeles	New York City
Prometheus Elec. Co. 511-W. 42nd St., New York City	"Prometheus"	18x3	....	B	....	Po	5	1000	3	Yes	No	$25.50	$25.50	**M. E. Hammond,** Pacific Bldg., San Francisco		New York City
Robeson Rochester Corp., 176 Anderson Ave., Rochester, N. Y.	"Royal-Rochester"	18x14	14	En	C	Po	1	600	1	Yes	Yes	$10.50	$10.50			Rochester, N. Y.
Russell Electric Co., 340 W. Huron St., Chicago, Ill.	"Hold Heet"	24x1½	...	BS	...	....	1	500	1	Yes	No	$2.50	$2.50	**J. G. Pomeroy,** 336 Azusa St., Los Angeles.	**Alexander & Lavenson,** San Francisco **North Coast Electric Co.,** All Branches **United Elec. Supply Co.,** Salt Lake City **Elec. Equipment Co.,** Butte, Mont.	Jobbers Stock
Rutenber Elec. Co., Marion, Ind.	"Marion"	18x13	11½	En	C	Po	1	615	1	Yes	No	$10.00	$10.00	**Atlantic-Pacific Sales Co.,** 646 Mission St., San Francisco	**Atlantic-Pacific Sales Co.,** San Francisco	San Francisco
Scheeline Mfg. Co., 76 Tehama St., San Francisco	"Hulbert"	VM	....	....	....	VM	VM	660 to 6600	....	....	....	.....	$35 to $250	**Scheeline Mfg. Co.,** San Francisco		San Francisco
Simplex Elec. Heatg. Co., 85 Sidney St., Cambridge, Mass.	"Sunbowl"	20x14	14	En	C	Po	1	600	1	Yes	No	$11.00	$11.00	**R. C. W. Libbey,** P.O. Box 793 Main Office, San Francisco	**Universal Elec. Co.,** San Francisco, **Reiman Whsle. Elec. Co.,** Los Angeles **M. Seller & Co.,** Portland	Distributors
	"Sunbowl Jr."	13x11	10½	En	C	Po	1	600	1	Yes	No	$7.00	$7.00			

ELECTRIC RADIATOR AND HEATER DIRECTORY
(CONTINUED)

Key to Abbreviations
B—Bronze
Br—Brass
C—Copper
Nk—Nickel
BS—Blue Steel
OI—Old Ivory
En—Enamel
Po—Portable
Pd—Pendant
St.—Stationary
Fr—Fireplace
VM—Various Models

Name of Manufacturer	Trade Name	Dimensions in Inches	Reflector Dimen. (Inches)	Finish: Heater	Finish: Reflector	Type	Heating Element: Number of Elements	Heating Element: Total Wattage	Heating Element: No. of Heats	Heating Element: Removable Elements	Heating Element: Fits Edison Socket	Price: East	Price: West of Rockies	Western Sales Representatives	Western Distributors	Nearest Point at Which Repair Parts Can Be Secured.
Sparling Elec. Prod. Co. 2 Letchworth St., Buffalo, N. Y.	"Hot Glow"	20x20 30x30	....	....	C	Fr	3	1400	3	....	No	.....	.....	**Regan & Koehler,** 240 Rialto Bldg., San Francisco **P. C. Koehler,** 1207 Washington Bldg., Los Angeles		
Stoughton Mfg. Corp., Stoughton, Wis.	"Hot Breeze"	.....	....	....	Nk	Po	1	600	1	Yes	...	$6.00	$6.00			Factory
Strait & Richards, Inc. Fabyan Place, Newark, N. J.	"Glolog"	.....	....	En	....	Fr	2	2000	2	Yes	....	$35.00	$40.00	**Atlantic & Pacific Sales Co.** 646 Mission St., San Francisco	**Atlantic & Pacific Sales Co.** San Francisco **Silver State Elec. Co.** Denver	San Francisco
Westinghouse Elec. & Mfg. Co. 1st. Natl. Bank Bldg., San Francisco	"Cozy Glow"	18x14	14	En	C	Po	1	600	1	Yes	Yes	$10.50	$10.50	**Fobes Supply Co.** San Francisco, Portland, Seattle **Illinois Elec. Co.** Los Angeles	**Westinghouse Agent Jobbers**	Jobbers & Dealers
Xardell Corp. Utica, N. Y.	"A-Little-Warmer"	18x10	....	Nk	....	Po	1	660	1	.....	.....	$7.50	$7.50			Factory

VACUUM CLEANER DIRECTORY
Published and Copyrighted by the Journal of Electricity, October 15, 1923.

A list of vacuum cleaner manufacturers giving catalog information on the equipment of each, with complete list of Western distributing agencies, as well as points where repair parts may be secured. The publisher does not guarantee this information, but to the best of our knowledge and belief it is correct at date of publication. When referring to this list in any way, mention the Journal of Electricity.

Key to Abbreviations
SW—sweeper type
TR—truck type
ST—stationary type
Sh—switch on handle
Sc—switch on cord
Sm—switch on motor
Sf—switch on frame
R—rotating
Rg—gear driven
Rs—shaft drive
Rc—chain drive
Bm—belt to motor
Bw—belt to wheels
S—stationary
V—vertical mounted
H—horizontal mounted
GE—General Elec. Co.
Dom—Domestic Elec. Co.
R&M—Robbins & Myers
Wx—Westinghouse
Berco—Birtman Elec. Co.
t—eastern price plus freight
*—price includes attachments

Manufacturer	Trade Name	Weight (in lbs.)	Style	Brush	Motor: Make	Motor: H.P.	Motor: Mounted	Switch Control	Attachments	Retail Price: Attachments East	Retail Price: Attachments West	Retail Price: Cleaner East	Retail Price: Cleaner West	Western Sales Representative	Western Distributors	Nearest Point At Which Repair Parts May Be Secured.
Apex Electrical Mfg. Co., 1067 E. 152nd St., Cleveland, Ohio	"Apex"	10½	SW	ST	Own	1/12	H	Sh	7	$10.00	$11.00	$57.50	$63.25	**J. A. Buckley,** 1405 Walnut St., Kansas City, Mo.	**Fobes Supply Co.,** Seattle, Portland **Illinois Elec. Co.,** Los Angeles **Electl. Equipt. Co.,** Butte **Intermountain Elec. Co.,** Salt Lake City	Distributors
Birtman Electric Co., Lake & Desplaines Sts., Chicago, Ill.	"Magnetic Housecleaner"	12½	SW	S	Berco	1/6	H	Sh	6	.....	.....	$76.00	$76.00	**H. J. Gute,** Division Mgr., 150 Post St., San Francisco	**H. J. Conrad,** 317 No. Oxford St., Los Angeles **Chas. H. Hanke,** 150 Post St., San Francisco **J. B. Howell,** Berkeley **C. M. Mackenzie,** 1507 Cabrillo, Torrance, Calif. **L. A. MacLean,** Oakland **Thos. P. Reid,** San Diego	San Francisco
	"Bee-Vac"	11	SW	S	Berco	1/6	H	Sh	5	.....	.....	$39.75	$39.75	**H. J. Gute & Co.,** 150 Post St., San Francisco **J. F. Kitchen,** 1325 So. Harvard Blvd., Los Angeles	Through Leading Jobbers	San Francisco and Los Angeles
Clements Mfg. Co., 601 Fulton St., Chicago, Ill.	"Cadillac"	12	SW	S	Own	1/4	H	Sh	7	$10.00	$12.50	$55.00	$60.00	**S. F. Compressed Air Co.,** San Francisco, Los Angeles	**F. E. Spencer,** 733 W. 8th St., Los Angeles **Heyman-Weil Co.,** San Francisco **Ray Bentley,** 219 Worcester Bldg., Portland	From any distributor.
The F. Bissell Co., 812 Lafayette St., Toledo, Ohio	"Bissell New HomeCleaner"	12½	SW	..	Own	....	H	Sh	8	.....	$10.00	.....	$60.00	**Atlantic-Pacific Sales Co.,** 646 Mission St., San Francisco	Same	**The F. Bissell Co.,** Toledo, Ohio
	"Bissell Super-Service"	..	SW	..	Own	1/3	H	Sm	7	.....	.....	$99.50	$99.50	.....	I. S. Cohen's Sons, 1015 Market St., San Francisco **F. E. Spencer,** 8th & Flower Sts., Los Angeles	San Francisco and Los Angeles
	"Bissell School"	25	SW	..	Own	1/3	H	Sm	8	.....	.....	$125	$125			
The Eclipse Machine Co., Sidney, Ohio	"Eclipse"	10	SW	Rg	GE	....	V	Sh	7	.....	.....	$45.00	$50.00	**Sprake Sales Co., Inc.,** American Bank Bldg., Los Angeles	Same	**Sprake Sales Co.,** Los Angeles and their branches.
Edison Elec. Appliance Co., 5600 Taylor St., Chicago, Ill.	"Hotpoint"	11	SW	S	GE	1/5	H	Sh	8	$10.00	t	$49.50	t	**P. H. Booth,** District Sales Mgr., Ontario, Calif. **B. E. Rowley,** District Sales Mgr., 60 East First South St., Salt Lake City		Ontario 155 New Montgomery St., San Francisco 1526–8th Ave., Seattle 412½ Stark St., Portland 60 East First South St., Salt Lake City

VACUUM CLEANER DIRECTORY
(CONTINUED)

Key to Abbreviations
SW—sweeper type
TR—truck type
ST—stationary type
Sh—switch on handle
Sc—switch on cord
Sm—switch on motor
Sf—switch on frame
R—rotating
Rg—gear driven
Rs—shaft drive
Rc—chain drive
Bm—belt to motor
Bw—belt to wheels
S—stationary
V—vertical mounted
H—horizontal mounted
GE—General Elec. Co.
Dom—Domestic Elec. Co.
R&M—Robbins & Myers
Wx—Westinghouse
Berco—Birtman Elec. Co.
t—eastern price plus freight
*—price includes attachments

Manufacturer	Trade Name	Weight (in lbs.)	Style	Brush	Motor			Switch Control	Attachments	Retail Price				Western Sales Representative	Western Distributors	Nearest Point At Which Repair Parts May Be Secured.
					Make	H.P.	Mounted			Attachments East	Attachments West	Cleaner East	Cleaner West			
Elec. Vacuum Cleaner Co., Ivanhoe Road, Cleveland, Ohio	"Premier Duplex" Model 21	12¾	SW	Bm	GE type	1/10	H	Sh	8	$10.00	$11.00	$60.00	$70.00		**Pacific States Electric Co.,** San Francisco **Capital Electric Co.,** Salt Lake City	San Francisco and other Western Cities.
	"Handy"	11 6½	SW S	R		1/8 1/8	V F	Sh	8 6	$10.00	$11.00	$42.50 $35.00	$52.50			
Eureka Vacuum Cleaner Co., Hamilton & Dewey Aves., Detroit, Mich.	"Eureka"	11	SW	S	Own	1/5	H	Sh	5	.....	.....	$45.00	$55.00	**Eureka Vacuum Cleaner Co.,** 128 Post St., San Francisco	**Woodill Hulse Elec. Co.,** Los Angeles **Poole Electric Co.,** 1206–4th Ave., Seattle **Eureka Vacuum Cleaner Co.,** 162 S. Post St., Spokane	From Factory Branch or from any Distributor.
Federal Electric Co., 8700 So. State St., Chicago, Ill.	"Federal"	13	SW	Re	Own	1/6	V	Sh	6	$8.00	$8.50	$55.00	$60.00 $65.00 *	**Federal Electric Co.,** 91 New Montgomery St., San Francisco	Same	All Pacific Coast Jobbing Points.
The P. A. Geier Co., 540 East 105th St., Cleveland, Ohio	"Royal"	11	SW	S	Dom	.....	H	Sh	8	$10.00	$13.50	$55.00	$60.00	**G. S. Rigden, care of Listenwalter & Gough, Inc.,** 940 Mission St., San Francisco	**Capital Electric Co.,** 310 W. 2nd S St., Salt Lake City **Creighton, Morris & McCorkle,** 53–4th St., Portland **Listenwalter & Gough, Inc.,** 819 E. 1st St., Los Angeles 940 Mission St., San Francisco	From any distributor.
Hamilton Beach Mfg. Co., 1501 Rapids Drive, Racine, Wis.	"Hamilton Beach"	15	SW	Bm R	Own	1/5	H	Sh	8	$12.50	.....	$58.50	$60.00	**J. E. Kamps,** 1157 E. Broadway, Long Beach, Cal.	Sold direct to Dealers.	**Electric Mfg. Co.,** 966 Mission St., San Francisco **Gans Bros.,** 141 S. Main St., Los Angeles
The Hoover Co., North Canton, Ohio	"Hoover" Model 103	16½	SW	Bm	Own	.08	V	Sm	7	$12.50	$13.50	$52.50	$60.00	**H. G. Glass,** Geary & Leavenworth Sts., San Francisco		San Francisco
	Model 541	15½	SW	Bm	Own	.09	V	Sm	7	$12.50	$13.50	$65.00	$74.00			San Francisco
	Model 961	30½	SW	Bm	GE	.17	V	Sm	7	$15.00	$16.50	$150	$160			San Francisco
Hurley Machine Co., 22nd St. & 54th Ave., Chicago, Ill.	"Hurley-Thor"	15½	SW	Rs	GE	1/7	V	Sh	8	$12.50	$12.50	$70.00	$70.00	**Hurley Machine Co.,** 425 Rialto Bldg., San Francisco	**Thor Shops** 154–5th St., Portland 222 Pine St., Seattle 124 Post St., San Francisco 306 W. 7th St., Los Angeles Fox Theatre Bldg., Oakland	Thor Shops
The Kent Co., Inc., 583 W. Dominck St., Rome, N. Y.	"Kent Vacuna"	32, 48, & 72	TR & ST	S	Wx	1/5 & up	V	Sf	10 & up	.....	.....	$130 & up	$130 & up	**Illinois Electric Co.,** Los Angeles **F. A. Tanner,** 77 O'Farrell St., San Francisco	.....	Rome, N. Y.
Landers Frary & Clark, New Britain, Conn.	"Universal"	12	SW	..	Own	1/8	H	Sh	7	$10.00	$10.00	$57.50	$57.50	**Landers Frary & Clark,** 335 New Call Bldg., San Francisco	**Through Jobbers**	San Francisco, Los Angeles
Pneuvac Co., 164 Fremont St., Worcester, Mass.	"Sweeper-Vac"	15	SW	R & Rg	Dom	1/5	H	Sh	7	$10.50	$11.00	$57.50	$60.00	**F. W. Biven,** 362 Jayne Ave., Oakland	**Schleuter Commercial Co.,** 1175 Market St., San Francisco **A. Schleuter & Co.,** 1314 Washington St., Oakland **A. A. Wilson,** Los Angeles **Sloat Wholesale Co.,** 330 East Morrison, Portland, Ore.	
The Regina Corp., Rahway, N. J.	"Regina Electric Home Cleaning Machine"	12	SW	S	GE	1/12	..	Sh	8	.....	.....	$69.75 *	$69.75 *	**The Regina Corp.,** 589–13th St., Oakland, Calif. Also Los Angeles, San Bernardino, Santa Ana, California.	.....	Oakland, Los Angeles, San Bernardino, Santa Ana.
B. F. Sturtevant Co., Hyde Park, Boston, Mass.	"Sturtevant"	25 to 86	TR	S	.....	1/6 to 3	H	Sc	4 to 8	$33.00 & up	.....	$125 to $1122	.....	.....	**B. F. Sturtevant Co.,** San Francisco, Los Angeles, Portland, Seattle.	
The Torrington Company, Torrington, Connecticut	"Torrington"	12½	SW	R	GE	1/5	H	Sh	9	.....	.....	$59.75	$66.00	**The Torrington Co.,** 938 Mission St., San Francisco 1305 S. Figueroa St., Los Angeles 70 Sixth St., Portland, 418 Ness Bldg., Salt Lake City	.....	From all western branch offices.
Wise, McClung Mfg. Co., for Sunshine Sales Co., New Philadelphia, Ohio	"Sunshine"	11½	SW	S	Dom	1/4	H	Sh	6	.....	.....	.....	.....	.....	**United Vacuum Cleaner Stores,** Main Office, Fresno, Calif. **Mine & Smelter Supply Co.,** Denver, Colo.	Fresno and Denver.
The Wise McClung Mfg. Co., New Philadelphia, Ohio	"America"	11½	SW	Bw	Arrow	1/8	V	Sf	6	.....	.....	.....	$65.00	**C. E. MacNichols,** 203–14th Ave. N., Seattle, Wash.	**Western Agencies, Inc.,** 711 Mission St., San Francisco Los Angeles **Electric Service Co.,** 175 Park St., Portland **Burghardt & Hauff Elec. Co.,** 1007–1st Ave., Seattle **Salt Lake Hdwe. Co.,** Salt Lake City	San Francisco and Portland.
	"Columbia"	11½	SW	Bw	Arrow	1/5	V	Sh	6	.....	.....	.....	$70.00	**Manufacturers Representatives Co.,** San Francisco and Los Angeles	**Manufacturers Representatives Co.,** San Francisco and Los Angeles **Getz Washer Sales.** Los Angeles	San Francisco and Los Angeles
M. S Wright Co., Worcester, Mass.	"Western Electric"	15	SW	Bm	Dom	1/8	H	Sh	6	$10.50	$11.00	$57.50	$60.00	**Western Electric Co.**	**Western Electric Co.,** San Francisco, Los Angeles, Seattle, Portland, Denver, Salt Lake City	All offices.

ELECTRIC RANGE DIRECTORY

Published and Copyrighted by the Journal of Electricity, October 15, 1923.

A list of Electric Range Manufacturers giving catalog information on the equipment of each, with list of Western Distributing Agencies where repair parts may be secured. The publisher does not guarantee this information but to the best of his knowledge it is correct at the date of publication. When referring to this list in any way mention the **Journal of Electricity.**

Name of Manufacturer	Trade Name	Model or Catalog No.	Type of Unit O—Open C—Enclosed	Floor Area	Height from Floor	Oven Dimensions	HEATING UNITS — Dimensions: Surface: Large	Surface: Medium	Surface: Medium	Surface: Small	Surface: Simmerer	Oven: Oven	Oven: Broiler	HEATING UNITS — Wattage: Surface: Large	Surface: Medium	Surface: Medium	Surface: Small	Surface: Total Watts Surface Units	Oven: Oven	Oven: Broiler	TO'L: Maximum Wattage	Temperature Control A—Thermostat C—Clock	Oven E—Elevated C—Cabinet L—Low	Retail Price	Western Sales Representative	Western Distributors	Nearest Point at Which Repair Parts May be Secured
Edison Elec. Appliance Co., Chicago, Ill.	"Hotpoint Hughes"	RS- 67	O	28½x52½	57	18x18x14	8¼	6½	6½	6½	...	2-12x12	.....	1500	1000	....	1000	4500	2-1500	....	7500	AC	C	$235.50	**Edison Elec. Appl. Co.,** San Francisco, Los Angeles, Seattle, Portland and Ontario, Cal.		All sales offices
		R- 67																						223.50			
		R- 79	O	28½x62¼	70	18x18x14	"	"	...	"	"	4-12x12	.....	"	"	.....	.....	6500	4-1500	....	12500	...	C	210.00			
		R- 75	O	28½x52½	64	"	"	"	...	"	"	12x12	12x12	"	"	.....	1000	4500	2-1500	1500	9000	...	C	325.00			
		R- 63	O	"	41	"	"	"	...	"	"	"	"	"	"	.....	.....	3500	1500	"	6500	...	...	247.00			
		R- 85	O	28½x28¼	33	"	"	"	...	"	"	"	"	"	"	.....	.....	3500	"	"	6500	...	L	174.00			
		R- 87	O	"	"	"	"	"	...	"	"	"	"	"	"	.....	1000	4500	"	"	7500	...	L	161.50			
		R-101	O	25 x44	41	16x12x18	6½	"	...	"	...	"	"	1000	"	.....	.....	3000	1200	1200	5400	...	C	175.00			
		R-105	O	21½x24	33	16x12x15	"	"	...	"	...	9x12	9x12	"	"	.....	.....	2000	1100	1100	4200	...	L	99.00			
		R-109	O	21½x37¼	"	"	"	"	...	"	...	"	"	"	"	.....	.....	3000	"	"	5200	...	L	76.75			
																								84.25			
Electrahot Appliances, Incl., 301 Fifth Ave., South Minneapolis, Minn.	"Electrahot"	B- 57	O	25 x43½	30	15x15x19	7½	7½	...	...	...	10x15	10x15	1500	1000	.....	.....	4500	1500	1500	7500	...	C	$135.00	**R. M. Burton** Alaska Bldg., Seattle		Seattle and San Francisco
Estate Stove Co., The Hamilton, Ohio	"Estate"	84	C	56 x28	58	18x18x12	8	...	...	6½	...	.....	16x18	1500	1100	1000	650	....	3300	1500	9650	...	E	.....	**The Estate Stove Co.,** Furniture Exchange, San Francisco		Factory
		88	"	56 x25	50	"	"	...	...	"	...	.....	"	"	"	....	"	....	.....	....	7800	...	E	.....			
		81	"	61 x28	55	"	"	...	...	"	...	.....	"	"	"	....	"	....	"	....	"	...	L	.....			
		79	"	54 x28	53	"	"	...	...	"	...	.....	"	"	"	....	"	....	.....	....	.....	...	L	.....			
		H- 83	"	29 x16	54	18x12x12	"	...	...	"	...	.....	12x18	"	"	....	"	....	2400	1000	5900	...	L	.....			
		80	"	39 x26	55	18x18x12	"	...	...	"	...	.....	16x18	"	"	....	"	....	2300	1500	7800	...	L	.....			
		82	"	23½x18	49	18x12x19	"	...	...	"	...	.....	12x18	"	"	....	"	....	2400	1000	4800	...	E	.....			
		78	"	28¾x18	43	12x11x17	"	...	...	"	...	"	"	"	"	....	"	....	1750	....	4250	...	E	.....			
Landers, Frary & Clark, New Britain, Conn	"Universal"	E- 91	C	27 x43½	52	14x14x19	8¾	...	...	...	...	.....	.....	1500	1000	.....	.....	4500	2000	1500	8000	...	E	$200.00	**Landers, Frary & Clark,** 335 New Call Bldg., San Francisco	**Electric Appliance Co.,** San Francisco **The Elec. Corporation** Los Angeles, Seattle and Portland **Fobes Supply Co.,** Seattle, Portland, Hardware Jobbers	Universal Service Stations San Francisco Los Angeles Seattle
		E- 92	"	"	58	"	"	...	...	...	...	.....	.....	"	"	.....	.....	"	"	"	"	...	"	215.00			
		E- 95	"	"	40	"	"	...	...	6¾	...	.....	.....	"	"	.....	660	4160	"	"	7660	...	"	175.00			
		E- 96	"	"	51	"	"	...	...	...	...	.....	.....	"	"	.....	"	"	"	"	8210	...	"	190.00			
		E- 93	"	"	40	"	"	...	...	...	...	.....	.....	"	"	.....	.....	3500	"	"	7000	...	"	165.00			
		E- 94	"	"	51	"	"	...	...	...	...	.....	.....	"	"	.....	.....	3500	"	"	7500	...	"	180.00			
		E- 90	"	27 x29	61	"	"	...	...	6½	...	.....	.....	"	"	.....	"	4160	"	"	7660	...	"	150.00			
		E- 98	"	27 x23¾	38	"	"	...	...	"	...	.....	.....	"	"	.....	.....	3160	"	"	6660	...	L	150.00			
		E- 99	"	"	"	"	"	...	...	...	...	.....	.....	"	"	.....	.....	2500	"	"	6000	...	L	140.00			
Magee Furnace Co., Boston, Mass.	"Electri-Coal"	.....	C	43¾x26¼	33	16x12x13	9	7	...	...	...	.....	.....	1500	1000	.....	.....	3500	1500	1500	6500	...	E	$550.00	**The T. G. Arrowsmith Co.,** 135 New Montgomery St., San Francisco	**Dealers and Central Stations**	San Francisco
	"Electric Alliance"	.....	C	.....	"	16x12x13	"	"	...	...	...	.....	.....	"	"	.....	.....	2500	"	"	5500	...	"	450.00			
																								440.00			
																								350.00			
Majestic Electric Appliance Co., 590 Folsom St., San Francisco, Cal.	"Majestic"	1000	O	21½x47	48	18x18x14	8½	...	...	...	...	14x14	14x14	1500	.....	.....	.....	4500	1300	1700	7500	...	E	$160.00	**Majestic Elec. Appl. Co.,** San Francisco, Kansas City, Mo.	**All Central Stations and Jobbers**	San Francisco and Kansas City
		1001	"	"	"	"	"	...	...	...	...	"	"	"	.....	.....	.....	"	"	"	"	...	"	180.00			
		1002	"	"	"	"	"	...	...	...	...	"	"	"	.....	.....	.....	"	"	"	"	...	"	200.00			
Geo. D. Roper Corp., Rockford, Ill.	"Roper"	2001	C	43 x26	32	16x16x13	8½	8½	...	...	...	12x16	12x 8	1800	1000	.....	.....	4800	1650	1100	7500	...	...	.....	**C. B. Babcock Co.,** 768 Mission St., San Francisco **W. W. Hall & Co.,** 217—15th St., Denver	**C. B. Babcock Co.,** San Francisco **P. B. Taylor,** Marsh Strong Bldg., Los Angeles	San Francisco
		2002	"	38 x26	30	"	"	"	...	"	...	"	"	"	"	.....	.....	2800	"	"	5500	...	...	.....			
		2003	"	31 x26	33	"	"	"	...	"	...	"	"	"	"	.....	.....	4800	"	"	7000	...	...	.....			
		2022	"	43 x26	29	"	"	"	...	"	...	"	"	"	"	.....	.....	4800	.....	.....	7000	...	...	.....			
		2005	"	17½x17½	22	.....	"	"	...	...	...	.....	.....	1600	1000	.....	.....	3600	.....	.....	3600	...	...	.....			
		2009	"	28 x17	"	.....	"	"	...	...	...	.....	.....	"	"	.....	.....	2600	.....	....	2600	...	...	.....			
		2012	"	40 x17	"	.....	"	"	...	...	...	.....	.....	"	"	.....	.....	1600	.....	.....	1600	...	...	.....			
Rathbone, Sard & Co., Aurora, Illinois	"Acorn"	E-61-5	E	20 x44	55	18x14x16	.....	.....	.....	.....	.....	.....	.....	2000	1200	.....	.....	4400	3000	1500	8900	...	E	.....	.....	**M. S. Barnett,** 180 New Montgomery St., San Francisco **F. D. Barnett,** Portland and Salt Lake City	Portland, Ore.
		E-61-HE	E	20 x44	55	18x14x16	.....	.....	.....	.....	.....	.....	.....	2000	1200	.....	.....	4400	3000	1500	8900	...	E	.....			
		2550	E	29 x44	55	18x14x18	.....	.....	.....	.....	.....	.....	.....	2000	1200	.....	.....	5600	3000	....	8600	...	L	.....			
Rutenber Elec. Co., Inc., Marion, Ind.	"Marion"	D- 90	O	22 x36	...	12x12x12	8	...	...	5½	...	7x 7	.....	1400	.....	.....	660	2060	1320	....	3380	A	E	$ 75.00	**Atlantic-Pacific Sales Co.,** 646 Mission St., San Francisco	**Through Leading Jobbers**	San Francisco
		126	"	18 x24	34	18x14x14	"	...	...	"	...	9x11	.....	"	1200	....	"	3260	2380	....	5640	"	L	98.50			
		135	"	22 x50	55	"	"	...	...	"	...	"	.....	"	"	.....	.....	3800	"	....	6180	"	E	160.00			
		130	"	27 x51	"	18x14x16	"	...	...	"	...	"	.....	"	"	.....	.....	"	2500	....	6300	"	"	170.00			
		145	"	"	62	"	"	...	...	"	...	"	.....	"	"	.....	.....	5000	"	....	7500	"	"	180.00			
		150	"	27 x52	73	"	"	...	...	"	...	"	9x11	"	"	.....	.....	"	"	2300	9800	"	"	207.00			
		147	"	27 x63	67	"	"	...	...	"	...	"	.....	"	"	.....	.....	7600	"	....	12600	"	"	227.00			
		110	"	20 x26	38	18x14x14	"	...	...	"	...	"	.....	"	"	.....	.....	3800	2380	....	6180	"	L	140.00			
		105	"	24 x26	"	18x14x16	"	...	...	"	...	"	.....	"	"	.....	.....	5000	2500	....	7500	"	"	155.00			

ELECTRIC RANGE DIRECTORY
(CONTINUED)

Name of Manufacturer	Trade Name	Model or Catalog No.	Type of Unit O—Open C—Enclosed	Floor Area	Height from Floor	Oven Dimensions	Heating Units: Dimensions: Surface: Large	Medium	Medium	Small	Simmerer	Oven	Broiler	Wattage: Surface: Large	Medium	Medium	Small	Total Watts Surface Units	Oven	Broiler	TO'L Maximum Wattage	Temperature Control A—Thermostat C—Clock	Oven E—Elevated C—Cabinet L—Low	Retail Price	Western Sales Representative	Western Distributors	Nearest Point at Which Repair Parts May be Secured
Simplex Elec. Heating Co., 85 Sidney St., Cambridge 39, Mass.	"Simplex"	25	C	30 x22	32	18x17x11	8	...	...	...	...	15x16	10x18	1200	...	...	...	3600	1200	2000	6800	...	L	$150.00	**R. C. W. Libbey,** Main Office, Box 793, San Francisco	**Universal Elec. Co.,** San Francisco **Holbrook, Merril & Stetson,** San Francisco **Reiman Whle. Elec. Co.,** Los Angeles **Marshall Wells Co.,** Portland	Distributors
		26	"	34 x15	26	13x13x13		...	...	...	...	10x11	12x13	1200	...	...	...	2400	600	1200	4200	...	E	75.00			
		27	"	51 x22	54	18x17x11		...	...	...	...	15x16	10x18	1200	...	...	...	3600	1200	2000	6800	...	"	175.00			
		29	"	57 x22	"	"		...	...	...	...	"	"	1200	...	...	...	4800	1900	"	8700	...	"	220.00			
Standard Electric Stove Co., Toledo, Ohio	"Standard"	D-619	C or O	24 x58	61	11x14x19	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	8500	A	E	.....	**Commercial Associates,** Los Angeles, San Francisco		
		619	"	24 x57	"	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	6700	"	"	.....			
		621	"	"	"	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	7700	"	"	.....			
		501	"	24 x26	"	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5260	"	"	.....			
		755	"	26 x47	"	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	9500	"	"	.....			
		639	"	24 x40	"	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	8000	"	"	.....			
		555	"	24 x38	53	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5600	...	L	.....			
		655	"	24 x50	61	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	8000	A	"	.....			
		455	"	24 x34	53	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	4600	...	"	.....			
		423-4	"	24 x33	61	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5600	...	"	.....			
		521	"	22 x30	49	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5600	...	"	.....			
		519	"	20 x29	61	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5600	...	"	.....			
		421	"	18 x26	49	11x14x16	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5000	...	"	.....			
		851	"	27 x40	61	11x14x19	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5000	...	"	.....			
		850	"	27 x46	53	"	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5600	...	"	.....			
		365	"	22 x33	22	11x12x14	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	3200	...	"	.....			
		A- 4	"	None	...	11x14x16	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	4000	...	E	.....			
		A- 5	"	"	...	11x14x19	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	5000	...	"	.....			
		951	"	24 x22	52	14x16x18	...	...	...	...	...	.....	.....	...	...	...	...	...	.....	.....	7600	...	"	.....			
H. G. Weeks Mfg. Co., The Hamilton, Ohio	"Weeks"	52	O	23 x16	35	16x10x 9	...	7	...	...	...	9x12	9x12	...	440	...	...	880	1100	1100	3080	...	L	$ 71.75	**T. G. Arrowsmith Co.,** 135 New Montgomery St., San Francisco	**Central Stations and Dealers**	San Francisco
		44	"	24 x17	38	18x14x12	9	"	...	...	...	"	"	1200	"	...	...	2400	1200	1200	4800	...	"	105.00			
		46	"	"	"	"	"	"	...	...	...	"	"	"	"	...	...	"	"	"	"	...	"	93.00			
		236	"	"	"	16x14x11	"	"	...	...	...	"	"	"	"	...	...	"	"	"	"	...	"	75.00			
		S- 64	"	26 x20	"	18x18x12	"	7	...	...	...	.....	.....	"	600	...	...	3000	1500	1500	6000	...	"	159.00			
		C-114	"	44 x24	33	16x18x12	"	"	...	...	...	14x14	14x14	"	"	...	...	"	"	"	"	...	E	186.00			
		105	"	39 x24	38	18x18x12	"	"	...	...	...	"	"	"	"	...	...	"	"	"	"	...	"	217.00			
		C-354	"	47 x22	33	18x18x15	"	"	...	...	...	"	"	"	"	...	...	"	"	"	"	...	"	210.00			
		454	"	"	"	"	"	"	...	...	...	.....	.....	"	"	...	...	3600	"	"	6600	...	"	222.00			
Walker & Pratt Mfg. Co., Boston, Mass.	"Crawford"	18-70	O	26 x49½	32	18x17x13	10	8	...	...	...	7½x12	7½x12	2000	1500	...	1000	5000	2000	2000	7000	...	E	$195.00	**B. Y. Gibson,** 680 Folsom St., San Francisco	**Western Elec. Co.,** San Francisco, Los Angeles, Oakland, Portland, Seattle, Tacoma, Spokane, Denver, and Salt Lake City	Distributors
		18-70	C	"	"	"	8½	7	...	...	...	"	"	1500	...	...	"	"	"	"	7000	...	"	219.00			
		18-60	O	26 x28½	"	"	8	...	...	...	...	"	"	"	...	...	"	"	2500	1500	7500	...	L	170.00			
		18-60	C	"	"	"	8½	7	...	...	...	"	"	"	...	...	"	"	"	"	7500	...	"	194.00			
		18-50	O	16½x28½	"	18x12x13	8	...	...	...	...	"	"	"	...	...	"	2500	2000	1000	4500	...	"	135.00			
		18-50	C	"	"	"	8½	7	...	...	...	"	"	"	...	...	"	"	"	"	4500	...	"	147.00			
		16-80	O	23 x41	32	16x17x14	8	...	...	...	...	"	"	"	...	...	"	3500	1500	1500	6500	...	E	122.00			
		16-80	C	"	"	"	8½	7	...	...	...	"	"	"	...	...	"	"	"	"	6500	...	"	140.00			
Westinghouse Elec. & Mfg. Co., San Francisco, Cal.	"Westinghouse"	B-3-19	O	43 x25	59	18x13x16	10	8	...	...	...	14x 8	14x8	2000	1000	...	...	4000	1500	1500	8000	A-C	E-L	$220.00	**Westinghouse Elec. & Mfg. Co.,** San Francisco, Seattle Los Angeles and Portland	**Fobes Supply Co.,** San Francisco, Oakland Seattle and Portland **Illinois Elec. Co.,** Los Angeles.	Distributors
		B-2-19	"	32 x24½	34	"	10	8	...	...	...	"	"	"	...	...	"	"	"	"	7000	A	L	150.00			
		515	"	24½x16½	31	12x16x12	...	...	...	...	...	.....	.....	1500	...	...	...	3000	1000	1000	5000	A	L	60.00			

Covering the Field with Correlated Advertising

Washington Water Power Company Uses Newspaper Advertisements and Broadsides to Increase Electric Iron Sales

To the electrical dealer who believes that "Every person that walks the earth is a prospect for my goods," correlated advertising is of exceptional value. Newspaper advertising is undoubtedly a great stimulator of sales and the printed broadside, sent by the direct-by-mail route, has also been found to be a strong means of increasing sales by breaking down sales resistance. The value of each of these forms of advertising has been proved by every merchant who used them and the returns to be derived from them, when used together, have been found to be even more satisfactory.

An example of how thoroughly successful is this method of covering the field was recently presented by the Washington Water Power Company of Spokane, Wash. The company, which conducts a retail electrical establishment under the name of the Electric Shop, desired to place about three hundred more electric irons on its lines. Plans for the campaign were drawn up and an offer was made which included the proposition that the purchaser could secure the iron, which was sold along with a patented ironing board, for a down payment of $1. The purchaser was to be given the opportunity to use the iron for ten days and if she found that it was not entirely satisfactory, she could return it and secure a refund of the money that she had paid in on the purchase. The balance of the purchase price was to be paid at the rate of $1 per month.

The Sunbeam electric iron was featured in the campaign and the company in addition to passing on the manufacturer's guarantee, also placed a guarantee upon the appliance. This added considerably to the attractiveness of the offer that was made.

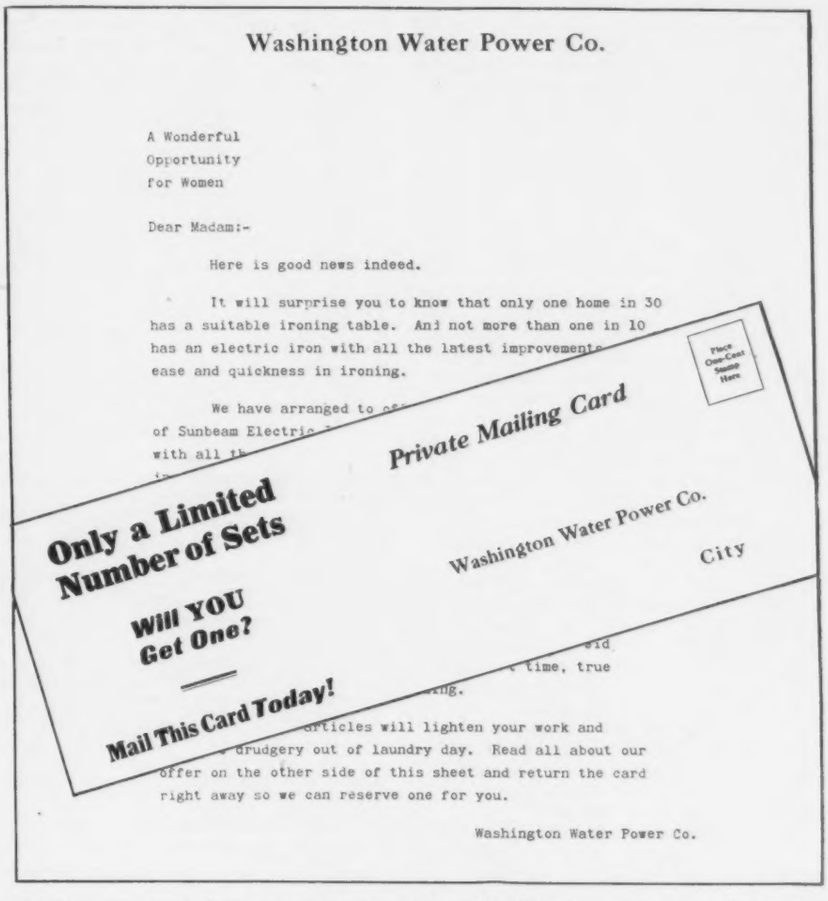
In announcing the sale, the company used both newspaper advertising and broadsides which were sent to its residential consumers. The newspaper advertisements were run intermittently in the Spokane newspapers and in those of the towns of the Inland Empire which are directly served by the Washington Water Power Company. These advertisements though not entirely devoted to the announcement of the special sale, were the means of attracting considerable attention to the company's offer.

The company in getting the direct-by-mail contact sent broadsides, which dealt exclusively with the article which was being pushed at the time, to each of its 32,000 residential consumers. All of the literature was not sent out at once, but instead, only one or two thousand of the folders were mailed each day. In this way the sales were spread out over the entire month of August, the time devoted to the sale of the irons. The broadside explained the offer that was made by the power company, laying stress upon the fact that the purchaser could secure the appliance upon ten days' trial for an initial payment of $1 and that the monthly payments were only $1.

The response to the correlated advertising was immediate. The broadside carried a return post card which directed the company to deliver one of the ranges and ironing boards to the customer. These cards were returned to the office of the Electric Shop at the rate of about eight or ten a day. Records which were compiled after the campaign showed that the greatest number of sales which were completed in Spokane were made in this way.

During the month of the campaign, 550 electric irons were sold by the Washington Water Power Company. Of the total number, 347 were sold among the 24,700 residential consumers of Spokane and 203 were sold in the outlying towns where there are 7,500 residential customers. The sales in the towns surrounding Spokane were made by the district representatives of the power company.

F. W. Redfield and **P. E. Braun** have organized the Santa-Hi Electric Company and have opened a store at 6781 Santa Monica Boulevard, Hollywood, Calif. They will conduct a general contracting and supply business.



Washington Water Power Co.

A Wonderful
Opportunity
for Women

Dear Madam:-

Here is good news indeed.

It will surprise you to know that only one home in 30 has a suitable ironing table. And not more than one in 10 has an electric iron with all the latest improvements ease and quickness in ironing.

We have arranged to of Sunbeam Electric with all th

Private Mailing Card

Place One Cent Stamp Here

Only a Limited Number of Sets

Will YOU Get One?

Mail This Card Today!

Washington Water Power Co.

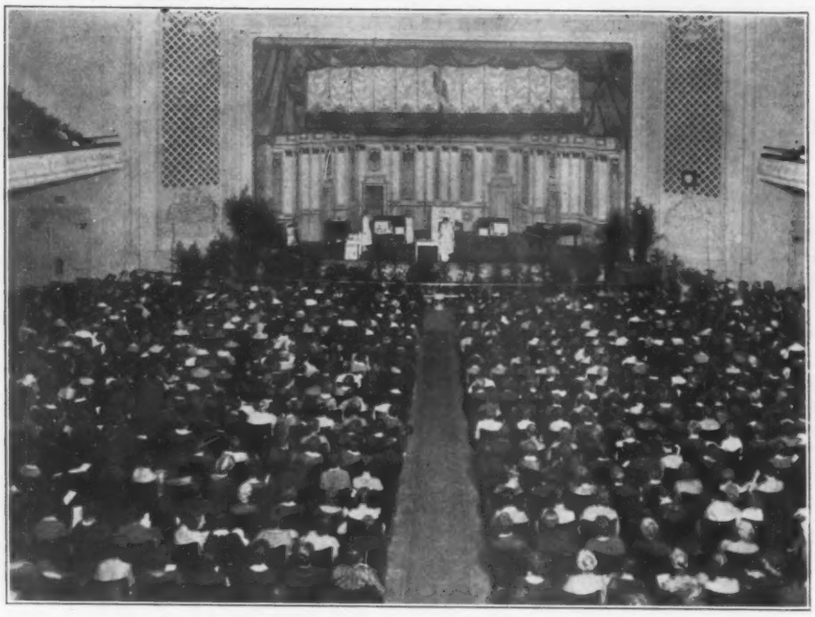
City

time, true

articles will lighten your work and drudgery out of laundry day. Read all about our offer on the other side of this sheet and return the card right away so we can reserve one for you.

Washington Water Power Co.

The letter, reproduced above, was sent to all of the residential customers of the central station company to notify them of the special offer. The insert shows the back side of the postcard.



A great deal of interest was evidenced by the women of Portland in the cooking school that was held in the municipal auditorium there. The group shown in the illustration was an average one.

Interest in Electric Ranges Increased by School

Seven Thousand Portland Women Hear of Advantages of Cooking by Electricity at Recent Cooking School

A tremendous stimulus has been given to electric cooking and the sale of electric ranges by the electric cooking school recently held in Portland, Ore., by the Edison Electric Appliance Company, Inc., in conjunction with the Morning Oregonian. Beginning Sept. 10 and continuing for five days, public demonstrations were made between the hours of 2 and 4 p.m. by Miss Bernice Lowen, a skilled demonstrator and home economist, who was specially secured, for this work, from the Chicago office of the Edison Electric Appliance Company, Inc.

Remembering the experience of last December at which time the first Oregonian electric cooking school was tried in Portland, when the crowds of housewives were greater than the building would hold, the public auditorium was secured. During the five meetings no less than 7,000 women attended and received direct from a trained demonstrator that instruction in the wonders of electric cooking which is sure to result in a wider use of the electric range.

In general the school was conducted much along the same lines as the one a year ago. Although known as the Oregonian Cooking School, the man behind the gun was R. W. Turnbull of the Edison Electric Appliance Company, Inc. He had small difficulty in enlisting the cooperation of the Oregonian, a paper that is making a special effort to be useful to the housewife, and which had already conducted one successful campaign. However, even as a business venture the newspaper is well satisfied with the returns.

Local merchants were liberal in purchasing advertising space and offering prizes in the baking contests. As cooking requires the use of foodstuffs of every description, the number of merchants who can be solicited is large indeed. Each day of the school a two-page spread appeared in the Oregonian, giving the interesting details of the coming lecture, special recipes applied to the electric range, lists of prizes, etc. These displays also carried the space assigned to the dealers. Both central stations, realizing the benefits to be derived from an increase in their range business, cooperated to the fullest extent, and advertised liberally.

The climax of the school came the last day when 783 entries were made in the baking contests. These baking contests were divided into three classes, bread baking, pie baking and cake baking, and each class had its own set of prizes. All prizes were donated by the merchants. An idea of the value and variety may be gained from the list of prizes which is reproduced below.

PRIZE LIST

Bread Division

Capital prize—Hotpoint Hughes Super-Automatic Range, value $235.

Second prize—One No. 6 Hotpoint iron, donated by the Stubbs Electric Co.

Third prize—Three 49-pound sacks Fisher's Blend flour.

Fourth prize—16 cans Calumet baking powder.

Fifth prize—12 cans Gold Bar products, furnished by Hudson, Gram & Co.

Sixth prize—16 cans Carnation milk.

Seventh prize—12 bottles assorted M. & R. flavoring extracts.

Eighth prize—Six bottles Knight's catsup.

Ninth prize—One package assorted products from the Porter-Scarpelli Macaroni Co.

Tenth prize—One three-pound can of Monte Cristo coffee from Martin Marks Coffee Co.

Cake Division

Capital prize—One No. 32 Thor electric washing machine, value $185.

Second prize—Hotpoint radiant grill, furnished by Portland Railway, Light & Power Co.

Third prize—One Hotpoint rectangular grill, from Jones Electric Co.

Fourth prize—Three 49-pound sacks Fisher's Blend flour.

Fifth prize—16 cans Calumet baking powder.

Sixth prize—One quart milk for one month by Portland-Damascus Milk Co.

Seventh prize—One dozen bottles assorted M. & R. flavoring extracts.

Eighth prize—16 cans Carnation milk.

Ninth prize—Six cans Gold Bar products, furnished by Hudson Gram & Co.

Tenth prize—Six bottles Knight's pickles.

Eleventh prize—One package assorted products from the Porter-Scarpelli Macaroni Co.

Twelfth prize—One three-pound can of Monte Cristo coffee from Martin Marks Coffee Co.

Pie Division

Capital prize—One Royal vacuum cleaner, value $60.

Second prize—One antique bronze Hotpoint ornamental "Hedlite" heater, furnished by Northwestern Electric Co.

Third prize—One Hotpoint 4-inch single-heat stove, furnished by E. L. Knight & Co.

Fourth prize—Three 49-pound sacks Fisher's blend flour.

Fifth prize—16 cans Calumet baking powder.

Sixth prize—One quart milk for one month by Portland-Damascus Milk Co.

Seventh prize—One dozen bottles assorted M. & R. flavoring extracts.

Eighth prize—16 cans Carnation milk.

Ninth prize—Six cans Gold Bar products, furnished by Hudson, Gram & Co.

Tenth prize—Six bottles Knight's vinegar.

Eleventh prize—One package assorted products from the Porter-Scarpelli Macaroni Co.

Twelfth prize—One three-pound can of Monte Cristo coffee from Martin Marks Coffee Co.

The rules of the contest were simple and strictly enforced. Competent judges were selected who judged impartially, using the scale adopted by the Master Bakers' Association. The rules used by the Oregonian Cooking School were as follows:

Entries can be made in either division, in any two divisions, or in all three divisions.

Entries must be delivered at the auditorium basement between 10 and 12 o'clock Friday morning, Sept. 14.

Entries cannot be returned to the entrant after being judged. After the judging all entries will be delivered to the Portland Women's Club and sold by it.

Each person making an entry in the contest will receive a numbered check. A duplicate of this check will be placed on the entry, and in no case will the judges know whose product they are judging.

Judging will be conducted according to the rules of the Master Bakers' Association.

The judges will be expert bakers, millers or other thoroughly competent persons.

The products which are advertised in connection with the cooking school must be used in baking the entries for the baking contest.

Needless to say both central stations and many of the dealers took advantage of the situation to push electric ranges. Special window displays were made and undoubtedly a considerable number of sales were directly traceable to the recent demonstrations in electric cooking.

The Portland Railway Light & Power Company has been very active in that department of sales during the whole summer and expects to add 1,500 ranges to its load during 1923. The Oregonian Cooking School added impetus to these sales and a new six weeks' drive on Hot Point-Hughes ranges has been started. During the week of Sept. 17-21 Miss Lowen conducted classes in the second floor auditorium of the Electric Building and a very thorough advertising campaign helped to put over the range idea. It is expected that several hundred ranges will be sold during the six weeks.

Following the cooking school in Portland the Edison Electric Appliance Company, Inc., arranged for similar schools in Spokane, Tacoma and Seattle. In each city the cooperation of a leading newspaper was enlisted to sponsor the demonstration classes, which will be followed by an aggressive sales campaign by the central station and dealers.

Will You Electrify the Thanksgiving Dinner Table?

Capitalize on the Woman's Desire to Have Her Home Attractive at the Time of this Annual Home-Coming Occasion

Tradition has pronounced that Christmas is a time of giving and it is for that reason, primarily, that many persons wait until then to present gifts to their friends. Merchants have endeavored to intensify their trade during the season prior to Christmas, by advertising the coming of that day. The general public is prepared to purchase articles which are suitable for gifts and the enterprising dealer has been the one to profit.

There are other occasions throughout the year when the housewife thinks not entirely of her friends, but more of her own home. Thanksgiving dinner is an occasion to which she will devote particular attention as she will also to New Year's dinner. Easter Sunday she will consider chiefly how she will clothe herself and her family that they may make a suitable appearance.

When the housewife begins to think of her own home, the electrical dealer finds a prospect for his stock in trade, for he has something to supply which will increase the beauty and utility of her home. To present this message to the women, it is necessary for the electrical contractor-dealer to advertise the fact that he has something which will add to the cheerfulness of the home, for it is the housewife's aim to make her home more cheerful and attractive.

Thanksgiving time offers the electrical industry an exceptional opportunity to secure new business. Long evenings necessitate the use of artificial illumination at an hour which is not customary in the summer time and to make the home cheerful, it must be illuminated in a modern manner. Constructive effort on the part of the dealer is necessary, however, to pave the way for these installations, as in many cases the housewife will not decide by herself that better illumination would make her home more attractive.

Newspaper advertising will to a large extent aid the dealer in securing a profitable business in furnishing new lighting equipment for many homes. By intimating that Thanksgiving is a time when the home should look its best, the dealer will bring his prospective customers into agreement with him at the start. If he can show clearly that modern illumination will enhance the beauty of any home his advertising copy will have stood him in good stead and he will be in a strong position to make a sale to the readers of the advertisement. This of course holds for the electrical contractor, for in many cases it will be necessary to do some rewiring in order to bring the installation up to standard.

To increase the demand for illuminating fixtures in the city in which it operated, a contractor-dealer firm published the following advertisement:

> At the Thanksgiving dinner—when the whole family is assembled—will be an appropriate time to display the new lighting fixtures that you have had installed. Your home is the center of your family and it is the duty and privilege of the head of the house to make that home as attractive as possible.
>
> Proper lighting will make YOUR home more attractive and cozy.
>
> The art of decorating the home with Light is being fully demonstrated in all of the electric homes.
>
> The home maker whose aim is to make the home comfortable for every occasion and in every detail has found that the day of the center light only, has passed. Side lights and candle lamps which will supplement the center lighting fixture, will make YOUR home a place where your family and your friends will enjoy spending an evening. The new glass candle shades have been designed for correct lighting and are beautifully decorated in the soft, blending tones with floral conventional and period designs in harmonizing colors.
>
> One of our trained illumination experts will be glad to call on you and advise you, as to what fixtures would be appropriate for YOUR home. Let him call now in order that you may have a home that is lighted correctly for the Thanksgiving dinner.

Lighting fixtures are not the only things that the electrical dealer can feature prior to Thanksgiving. According to an advertisement run by one concern, "The approach of Thanksgiving suggests new table appointments, such as coffee services, waffle irons, toasters, grills, and percolators. Electric appliances will simplify the serving of your Thanksgiving dinner." The same concern said in another of its advertisements,——— "GLEAMING ELECTRIC WARE FOR THANKSGIVING — to possess a silver coffee service is indeed fortunate. To own a service with an **electric percolator,** permitting the hostess to direct the coffee-making personally, inspires pride as well as pleasure."

Tieing-in with phonograph dealers, one electric store ran this advertisement.

> Whether it's just your own little household spending a quiet day together, or a greater reunion of all the family, **Music** just seems to fit right into the spirit of Thanksgiving!
>
> There's the feast of course, but that only lasts an hour or two. And all through the long afternoon and evening, it's great to have an electric phonograph on the entertainment committee. All the old-time melodies that stir the heart—all the peppy new tunes that make you dance! Everything in music is yours with the ——— Electric Phonograph. Christmas is coming too. More celebrations and entertainment. Get your ——— now — before Thanksgiving — and enjoy it all through the Winter Holiday season.

The merchant who will make the most of the seasonal opportunities can find a large number of suitable advertisements which will adapt themselves to the sale of electric appliances. The creation of advertising copy which will tie-in with the seasonal demand will no doubt be an aid in the increasing of sales.

Department Store Presents Electrical Exposition

All Modern Electrical Household Appliances Shown in Operation and Lecturers Explain Advantages to Visitors

The department store has entered the electrical appliance field in earnest. Its earlier advent into this branch of merchandising was unquestionably delayed by the fact that the normal discounts on electrical devices did not show a profit equal to the cost of doing business. The discount situation on reliable merchandise has changed but slightly, if at all, but department store managers are awake to the fact that they can no longer afford to remain out of a field so fertile in its development possibilities. The growth of the appliance business has been so rapid and so spectacular that it has commanded the attention and thought of every merchandiser who views his business with a vision of the future.

Many such stores throughout the country have put in electrical departments where they carry small supplies, such as sockets, plugs, tape, etc. They also sell portable and stand lamps, and the more popular lamp socket devices such as flat irons, toasters, etc. The development of the electric range and water heater, together with electric air heaters of large capacity, has not, however, received great attention until very recently.

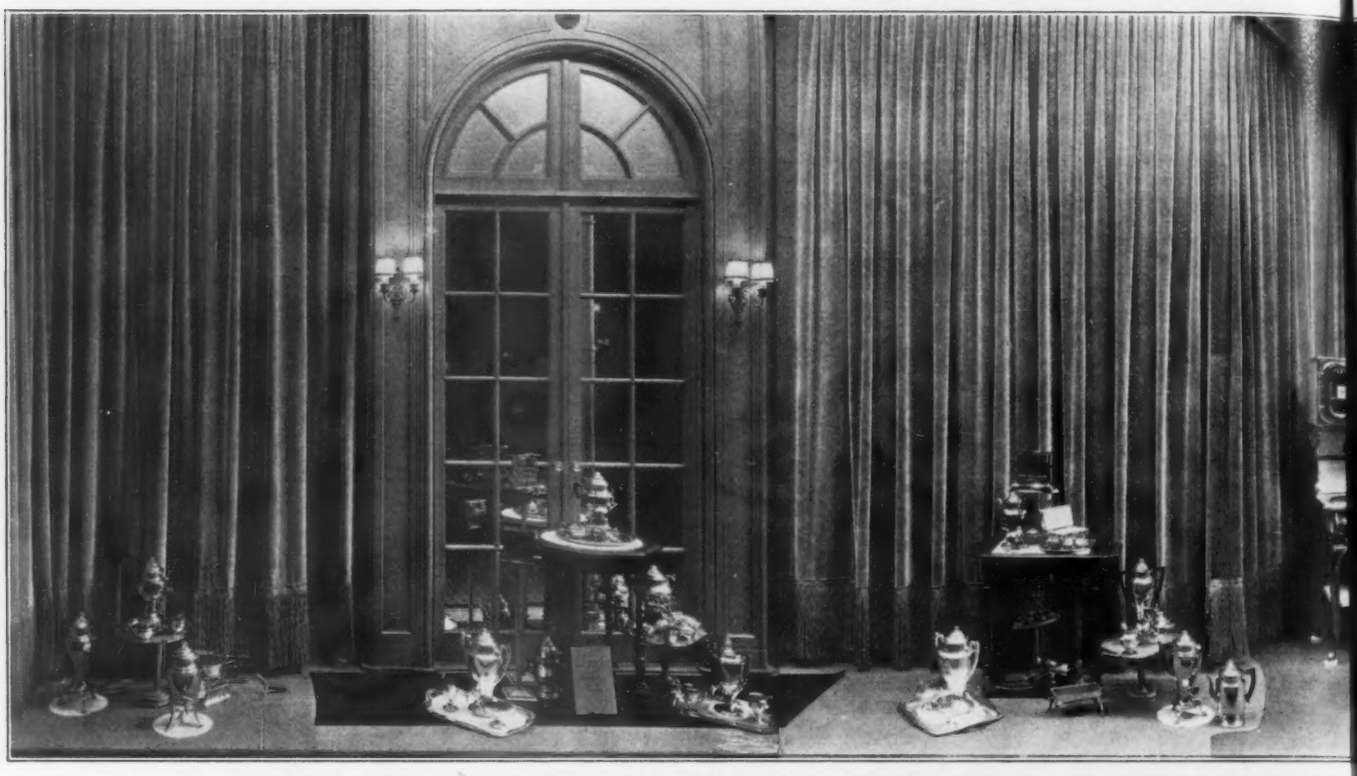
One of the department stores which has made a notable step in the direction of general electrical development is The Emporium, of San Francisco, Calif., which has a large department devoted to all the domestic electrical devices and has adopted novel means for the promotion of the electric applications idea. On Sept. 12, announcement was made in the columns of the press of a display and demonstration to be held in the store auditorium. The actual operation of equipment was announced, as were motion pictures and a course of lectures.

Around the sides of the auditorium booths were constructed for the display of the various appliances. Trained demonstrators were on hand at each booth for the necessary explanation regarding the devices and, so far as possible, the appliance was in each case actually operating. For example, at a booth displaying waffle irons, waffles were made and served with syrup; coffee was made in an electric percolator in another booth and was served with light cakes; an electric dish washer was shown in operation and vacuum cleaners were in actual use. In addition to the various lamp socket devices an electric range was connected up and a trained factory demonstrator baked cakes, bread and cookies and also roasted meats and cooked vegetables, all of which were sampled by the visitors. This method of approach to the consumer was highly successful and, particularly in the case of the lamp socket devices, resulted in a very satisfactory increase of sales. In addition to this, many prospects were developed for the sale of ranges, water heaters and air heaters and the sales possibilities of the electric appliance business together with the advantages of this type of display were made very clear to the management.

In addition to the newspaper advertising employed, the windows of the store were devoted to a display of electrical appliances and devices. These windows never failed to draw a crowd and were so effective in their attention-getting value that they were allowed to remain in for a period longer than the usual trim. The photographs on the following two pages show the window display. It should be borne in mind that these photographs are really of one long window and that to be accurately viewed they must be placed end to end.

The entire display was made possible by the cooperation of The Emporium, the Great Western Power Company, and the Pacific Gas and Electric Company.

Presenting a Modern Display of Electrical Pro

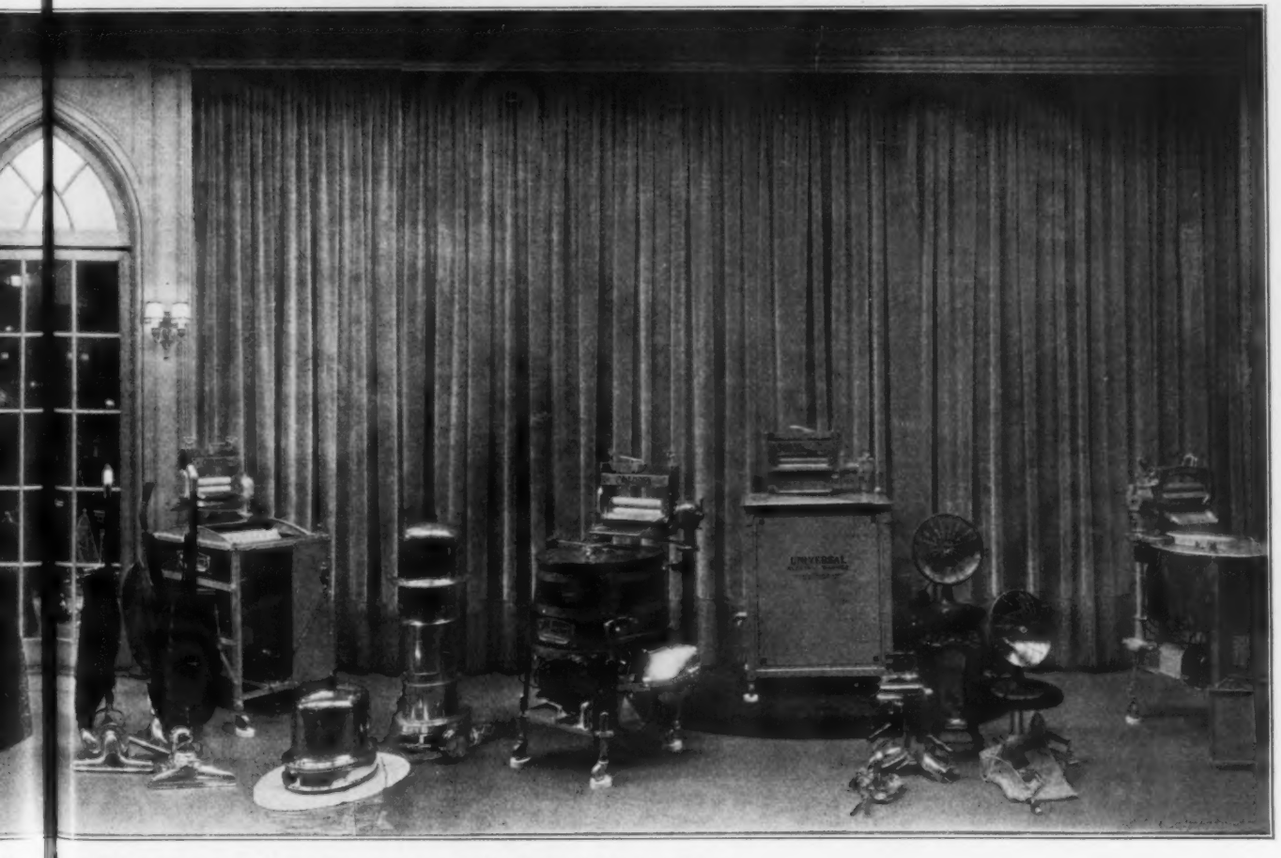


The photograph which is reproduced on the top and bottom of these two pages is a single picture and to

The second half of the row of display windows is shown here. All of the avail

Products in the Department Store Window

and to gain an idea of the display that was presented it should be regarded as one continuous panorama.



available window space at The Emporium was devoted to the electrical appliances.

INDUSTRIAL NEWS

Moffat Tunnel Driving Contract Signed by Commission

The contract for the boring of the Moffat Tunnel, the bore through the Rocky Mountains that will unite the two halves of the State of Colorado, has been let to Hitchcock & Tinkler, San Francisco and New York tunnel contractors. Under the contract, which is drawn on the profit-sharing plan, the cost of the work is placed at $5,250,000. A flat sum of $140,000 is to be paid to the contractors.

The contract states that the work must be completed in forty-six months and that for every day that the opening is delayed beyond this time, the contractors must pay $1,000. If the work is completed before that time, a bonus of $1,000 a day will be paid. If the tunnel is constructed for less than the price fixed, the balance will be divided equally between the Moffat Tunnel Commission and the contractors. If the cost of the tunnel is greater than $5,250,000, the balance will be borne by the Commission.

R. H. Keays, recently appointed chief engineer of the project, will have general supervision of the work, the actual construction only being left to the contractors.

The Moffat Tunnel itself will be approximately 6 miles long and will be at an elevation of about 9,000 ft. The tunnel when completed will lessen the distance between Salt Lake City, Utah, and Denver, Colo., by 55 miles over the Union Pacific System and by 172 miles by way of the Denver & Rio Grande lines. The railroads will pay a rental to the Moffat Tunnel Commission for the privilege of using the right-of-way thus formed.

The Colorado Power Company has been awarded a contract for supplying electric power for driving the tunnel. Lines will be erected to both portals in order that work may be done at both ends simultaneously.

Portland Steam Plant Addition Is Placed in Service

The new $500,000 addition to the Portland, Ore., steam plant of the Northwestern Electric Company, construction of which was begun last spring, has been completed and the turbo-generator with a capacity of 12,000 kw. has just been put in service. Including the cost of the new addition, the company now has an investment in land, buildings and machinery at the foot of Lincoln Street totaling $2,500,000, and the general capacity has been increased to 22,500 kw.

Steam from the new turbo-generator is condensed on a surface condenser having 15,000 sq. ft. of tube surface. Water for the condenser is supplied by a motor driven pump having a capacity of 20,000 gal. per minute.

According to L. T. Merwin, general manager of the company, for the present the company finds it economical to take care of the needs of the community by using the waste from the Oregon lumber mills to produce electricity, by burning "hog fuel." In his opinion it is only a matter of a short time until the company will have to build new hydroelectric plants on some of its water power sites in the mountains in the vicinity of Portland.

Lighting Rates Will Be Reduced in Western Washington

Following its announced policy of reducing rates as fast as facilities and volume of business will permit, the Puget Sound Power & Light Company, operating in the Northwest from Seattle headquarters, has filed a new schedule of electric light rates for residences in a large territory in western Washington. The schedule becomes effective Nov. 1. The new lighting rates are the first changes made in this territory by the Puget Sound Power & Light Company since April, 1914, when the present rates became effective. Power rates, however, were lowered in 1922.

The new schedule affects all the territory served in Pierce, King and Snohomish Counties, outside the cities of Tacoma, Seattle and Everett. The companies affiliated with the parent corporation making the change in rates are: The Tacoma Railway & Power Company; Puget Sound Power & Light Company, Tacoma and Seattle divisions; Puget Sound Electric Railway Company; Pacific Northwest Traction Company, southern division, and the Puget Sound Power & Light Company, Everett division.

The schedule provides for a rate of eight cents a kilowatt-hour for the first 60 kw-hr. and three cents a kilowatt-hour for all in excess of 60 kw-hr. The old rates were: eight cents per kilowatt-hour for the first 60 kw-hr., six cents per kilowatt-hour for the second 60 kw-hr., and five cents per kilowatt-hour for all over 120 kw-hr. The rate of three cents a kilowatt-hour for electric cooking remains unchanged.

The annual Pacific Coast meeting of the American Society of Agricultural Engineers is to be held on the campus of the University of California at Berkeley, Calif., Oct. 19. Among the papers to be presented is one entitled, "The Application of Electricity to Agriculture in California." This paper will be presented by R. C. Griffin, power sales engineer of the Pacific Gas and Electric Company.

Robt. L. Eltringham Resigns from Cooperative Campaign

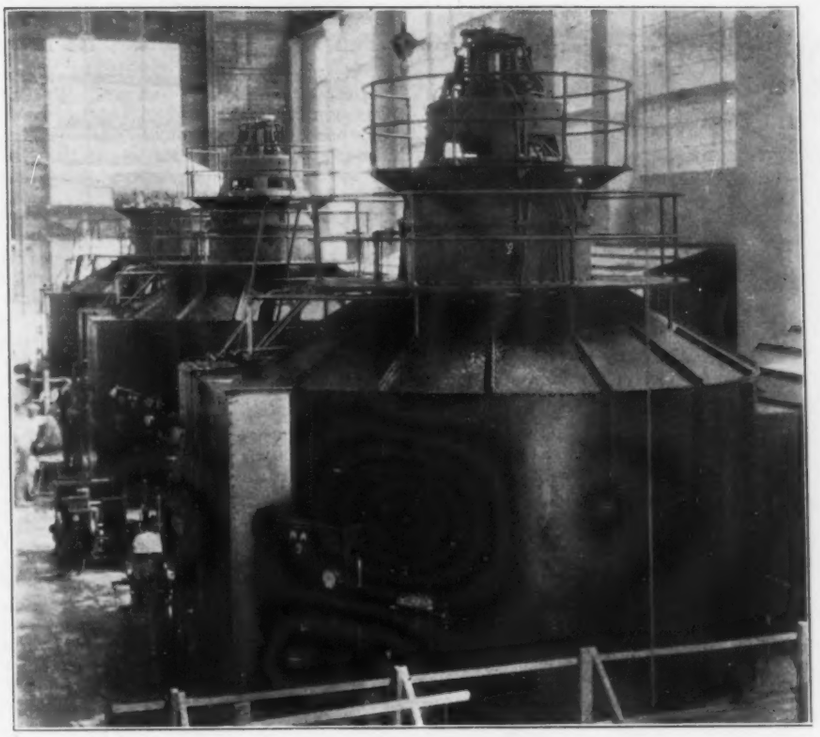
Robert L. Eltringham, executive manager of the California Electrical Cooperative Campaign for the past three years, has resigned from that position effective Nov. 1, 1923. Mr. Eltringham's resignation was presented at a meeting of the Advisory Committee of the Campaign held in Los Angeles Oct. 1 and was accepted by that body with regret. He will stay with the Campaign until Dec. 1, 1923.

Under his direction, the Cooperative Campaign has risen to a point where it is recognized as one of the foremost organizations of its kind in the country. The pioneer of such movements in the electrical industry, it has initiated practices which have been adopted almost universally. During Mr. Eltringham's administration an electric home program which has never been equaled has been carried through, the June Bride Week merchandising campaign was initiated and successfully carried out during two seasons, and the Better Merchandise Display lighting exhibit was perfected and placed on the road. His latest scheme for spreading the electrical message is through the conversion of two railroad cars into portable electric home and electricity on the farm exhibits, and is being studied at the present time.

ROBERT L. ELTRINGHAM

Previous to joining the Campaign as executive manager, Mr. Eltringham was electrical engineer for the Industrial Accident Commission of California for a period of six years. Before that he had been industrial engineer for the Great Western Power Company. He is a member of the American Institute of Electrical Engineers.

Mr. Eltringham's plans for the future are indefinite at this time. He is planning to visit the East for a much needed vacation and rest.



Interior of the Southern California Edison Company's Big Creek No. 3 power house, the largest hydroelectric plant west of Keokuk, Iowa.

Big Creek No. 3 Is Put on Power Company's Lines

Largest Hydroelectric Power House West of Keokuk Is Serving Southern California Edison Company Customers

Big Creek No. 3, the largest hydroelectric generating plant west of Keokuk, Iowa, has been put on the lines of the Southern California Edison Company. The first unit was put in operation on Sept. 30 and the second came on Oct. 3. These two units carried a load of 52,000 kw. until Oct. 7, when the third unit was put in service. The total capacity of the three units is 75,000 kva.

Big Creek No. 3 is located on the main San Joaquin River and is the largest of the power houses that have been designed for the Southern California Edison Company. It is to have an ultimate capacity of 150,000 kva. This power plant is the fourth one of the stations that the Edison company has completed on the headwaters of the San Joaquin River. There will ultimately be 19 power houses in the immediate vicinity.

The plant which has just gone on the lines has an initial installation of three Wellman-Seaver-Morgan 35,000-hp., 423 r.p.m. vertical turbines operating under a head of 760 ft. These drive three Westinghouse Electric & Manufacturing Company 25,000-kva., 11,000-volt, 50-cycle generators. The plant uses the water after it comes from the tail race of Big Creek No. 8, a tunnel 4.7 miles long and 22 ft. square carrying 3,000 sec.-ft. of water to the new power house. The flow of water is controlled by a 22-ft. diameter circular sluice gate.

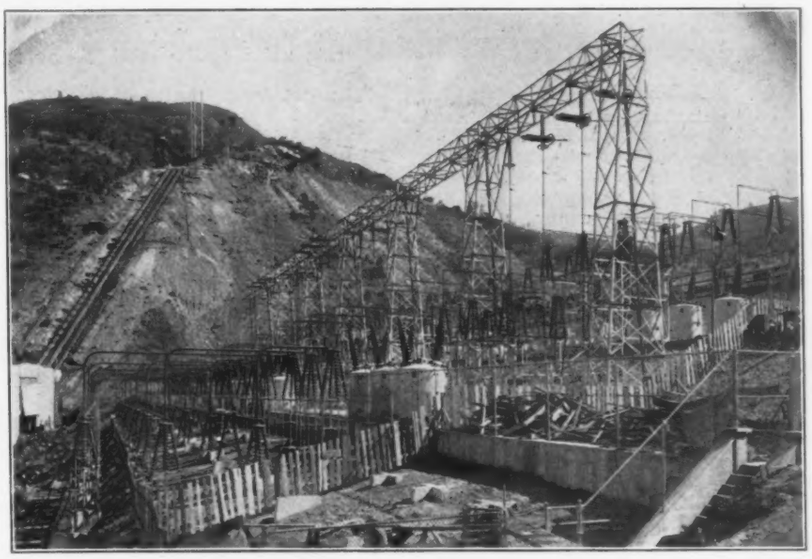
The penstocks leading to the turbines are made entirely of lap welded pipe, varying in diameter from 7½ ft. to 6 ft. The valves at the bottom of these lines are of the needle type manufactured by the Wellman-Seaver-Morgan Company. Butterfly valves 7½ ft. in diameter are located at the upper end of the penstocks and are arranged for control from the power house. A surge tank, hewn out of solid rock and similar in shape to an hour-glass, is located at the penstock intake. Three vent pipes are located at the head of the penstock lines to preclude any damage to the pipe should the gates be closed at any time.

The switch garden at Big Creek No. 3 occupies a space 195 x 430 ft. and consists of a series of concrete benches placed on the slope of the mountain. There is a difference in elevation, between the upper and lower benches, of 46 ft. These benches support the oil switches, buses, etc. All power from all of the Big Creek plants now in operation, goes to this switch garden before being transmitted to the southern California markets.

Present plans of the company call for the ultimate installation of three more units in the power house and the raising of the capacity to 150,000 kva. Space for one additional unit in the power house has been provided so that when the company's load increases sufficiently the addition can be made at nominal cost. The other two units will be housed in another section of the structure which will be added when necessary.

The power that is generated at Big Creek No. 3, together with the other plants in the vicinity, is transmitted to distributing centers a few miles from Los Angeles at 220,000 volts. The transmission line is 240 miles long and is of double circuit type. This line leads to the Eagle Rock substation and also to the new Laguna Bell substation, in the industrial section of Los Angeles.

Bids for construction of the first unit of the proposed Lake Cushman power project, under development by the City of Tacoma, Wash., will be called in about 60 days, according to J. L. Stannard, chief engineer. Mr. Stannard recently completed an inspection trip of the property. The design of the big dam to go into the canyon of the Skokomish River has been completed by the project engineers, and is awaiting now the approval of the patentee of the form of dam to be used, and that of the state hydraulic engineer. Estimates on generating machinery and other parts of the power installation are also being made, preparatory to naming the total amount which will be needed in the bond issue.



Switch garden located on the mountain side below Big Creek No. 3 on the San Joaquin River.

Discuss Arizona Plan of Developing Colorado River

Applicant for Diamond Creek Site and Arizona Committee Are Given Hearing by Federal Power Commission

On Sept. 24 the Federal Power Commission gave to a committee of nine members from the State of Arizona, headed by Governor W. P. G. Hunt, an opportunity to present the so-called Arizona plan for the development of the Colorado River within the boundaries of that state. Concurrently the Commission gave a hearing to James B. Girand upon his application for a license for a water-power project in the Colorado, to be located at Diamond Creek in Arizona, and to opponents to the granting of Mr. Girand's application.

State Senator H. A. Elliott, who acted as spokesman for the Arizona committee, the first to be heard, presented a brief setting forth of the desire of the state to develop for its own benefit, by a series of state-owned and operated power plants, what it considers to be one of its greatest resources, the power possibilities of the Colorado. Mr. Elliott stated that it was proposed to proceed first with the Diamond Creek development; this to be followed in a few years by the Glen Canyon reservoir; and then subsequent installations to be added along the river as the power market demands. He asserted the unequivocal opposition of the State of Arizona to the so-called Colorado River Compact, stated that the state would never agree to its terms, and decried any tendency on the part of the Federal government to use coercive measures to bring about ratification of the compact. Senator Elliott admitted, in response to a question by Secretary Weeks, that Arizona did not have a definite plan for carrying out its projects, or the necessary constitutional authority to undertake its financing, but stated that a special session of the legislature could be called and an election looking to effecting a change in the State constitution could be carried out in six months' time. Mr. Elliott stated that Arizona realized the urgency for beginning operations without delay, and therefore did not oppose granting Mr. Girand's license, because the state could take over the license and any works constructed thereunder through condemnation proceedings.

C. T. Knapp, attorney for Mr. Girand, pointed out that for ten years Mr. Girand had been endeavoring to carry out this development; that he had complied with all requirements of the various agencies of the government with which he had had to deal; and that he had held preliminary permits from the Department of the Interior and subsequently from the Federal Power Commission continuously from 1915 to the present time, thereby acquiring a vested legal right as well as a moral right to a license. Mr. Knapp stated that Mr. Girand was willing to accept a license containing conditions which would render it subject to the limitations of the Colorado River Compact; that Mr. Girand's water permit, issued by the State of Arizona, would become null and void if work on the project is not commenced before December 26, 1923; and that inasmuch as it is apparent that the state would never renew the water right. Mr. Girand would undoubtedly lose his priority together with the $140,000 already spent in engineering and legal activities in connection with the project.

Delph E. Carpenter, who acted as spokesman for the States of Colorado, Utah, and New Mexico, emphasized the importance to the future development of the Southwest of the ratification of the Colorado River Compact so as to avoid the evils of litigation, otherwise inevitable, and stated that he was particularly opposed to granting Mr. Girand's license because this would create a vested water right not subject to the provisions of the compact and because the approval of one project before a scheme for the development of the entire river had been worked out would necessarily preclude the satisfactory carrying out of a comprehensive project providing for utilization of the resources of the entire stream.

Congressman Phil D. Swing, of Imperial Valley, Calif., Col. B. F. Fly, of Yuma, Ariz., Chaplain Hartman of the southern California post of the American Legion, U. S. Senator Ralph B. Cameron, W. G. Clark, and George Maxwell each urged the Commission not to grant Mr. Girand's application because such action would interfere with the early carrying out of the Boulder Canyon project, or similar projects designed to relieve the danger from floods in the lower river and to provide water for irrigation in the lower basin.

No action was taken by the Commission at the conclusion of the hearing. The matters presented will be studied by the Commission's staff, and will probably receive consideration at the next meeting of the Commission, to be held on or about Oct. 15.

Development Work on Stave Lake Project Is Started

The British Columbia Electric Railway Company recently started work on its plant at Stave Lake on the properties acquired from the Western Canada Power Company. It is estimated that a total of 157,000 hp. may be added to the output of the company and it is the purpose to develop this power in three separate units as the market may require.

The first development will be a 25,000-hp. addition to the present Stave Falls plant and will be located in a separate structure which will be erected adjacent to the present plant and will be operated by the same crew that is operating the existing power house. Remote control apparatus will be used to a considerable extent.

The second plant will be erected on the upper end of Stave Lake and will be supplied with water from Alouette Lake by means of a dam on the lake and a 3,900-ft. tunnel. A drop of about 140 ft. will be utilized there to develop 12,000 hp. The third power house will have a capacity of 120,000 hp. and will be located about 3½ miles down the river from the site of the present plant.

The Sumner Iron Works of Everett, Wash., is installing an electric furnace costing $10,000, with capacity of 25 tons of castings a day. The furnace was purchased from the Green Electric Furnace Company of Seattle.

San Francisco Utilities Do Not Wish to Sell Systems

Both the Pacific Gas and Electric Company and the Great Western Power Company have informed the Hetch Hetchy advisory committee of the San Francisco Board of Supervisors that they do not care to sell their distributing systems in San Francisco. The committee sent letters to both utility companies, requesting information concerning their stand regarding the sale of the distributing systems.

The Pacific Gas and Electric Company, through Wigginton E. Creed, the president of the company, stated that it was not in a position to offer the San Francisco distribution system for sale as the entire system was developed for serving a large section of the State of California, and that the service in any one portion of the state is directly related to the service in every other portion thereof.

J. B. Black, vice-president and general manager of the Great Western Power Company, stated that the sale of that company's distribution system in San Francisco would disrupt the plans for development as the San Francisco system was only a part of the company's properties and any severance would seriously hamper the plans for future development that had been made.

Students Will Get Information Concerning Utilities

Following the lead set by the universities in Colorado, New Mexico and Wyoming, students in high schools and upper grade classes in the three states will receive instruction covering the public utility industry. The Rocky Mountain Committee on Public Utility Information has been asked to cooperate with the school heads and will endeavor to supply speakers at every time that the educational institutions shall need them. Lecture and study courses will be incorporated in the plan.

A large number of schools have already made application to the Committee for assistance in the placing of information before the students and a series of papers designed especially for the class rooms is being prepared. These papers will be read before the students by executives of the public utility companies and will deal with all phases of the industry. The first paper, the title of which is "The Romance of the Kilowatt," will deal with electricity, its history and development.

The Public Utilities Commission of Utah has recently questioned the authority of the municipal plant of Hyrum, Utah, to arbitrarily raise its rates on electricity without consulting the Commission. The utilities board allowed the plant to raise its rates some time ago to 9 cents per kilowatt-hour for lighting rates and 4 cents per kilowatt-hour for power service. The municipal plant took it upon itself to raise the lighting rate to 10 cents per kilowatt-hour without the consent of the Commission.

The California Electrical Cooperaitve Campaign has recently moved its Los Angeles offices from the Baker-Detwiler Building to the Roberts Building at the southwest corner of 3rd and Main Streets. The office number is 631 and the new telephone number is Main 2496.

Plans Made for Development of Water Power in India

An application has recently been made to the Government of Madras for the sole right to develop electric energy from the Pykara River in the Nilgiri Hills of South India. It is proposed, according to advices to the Department of Commerce, to construct a dam 150 ft. high across the river forming a lake which will have a storage capacity of 6,000,000,000 cu. ft. with a catchment area of 38 sq. miles. The water from the lake will be conveyed by an aqueduct one mile in length, on the right bank of the river, to a forebay and from there through a pipe line to the power house situated at the bottom of the gorge.

The project is so outlined that the tail water, after use, will be allowed to flow into the Moyer River. As the Moyer River flows through a deep gorge, the establishing of another power house is contemplated at a suitable point to generate electricity by the further fall of the river from the deep gorge.

A total of 50,000 hp. is expected to be generated under the present scheme together with its future possibilities. The power obtained is to be utilized for electro-chemical industries and electrical reduction of ores.

According to the Semaphore of July 13, 1923, Constantine, the capital of Eastern Algeria, is to have installed, for the benefit also of its neighboring towns, two dams, for developing power and light. One dam at Kreneg is to be about 115 ft. high, which will provide a storage reservoir of 41,000,000 cu. ft. capacity. The cost of this plant is estimated at 13,200,000 francs. About 5,790 hp. will be available. The lower dam, called the Beni-Haroun, will be 130 ft. in height, with a canal 650 ft. long. The power available will be about 2,175 hp. and the cost of construction 7,000,000 francs.

General Fund to Stand Part of Street Lighting Costs

Making the statement that "Seattle can now advertise to the world that its municipal light plant is furnishing current for street lighting purposes at 1 cent per kilowatt-hour," the City Council of Seattle, Wash., has recently passed an ordinance fixing the rate at that figure. Previous to this time the city street department has been paying the light department at the rate of 4 cents per kilowatt-hour for this service.

The balance of the cost which was previously charged to the street department, will be taken fro mthe city's general fund, a provision being made that maintenance costs of the street lighting apparatus be defrayed in this manner. The scheme of reducing the actual power rate and of tacking the balance on the general fund of the city was proposed by Mayor Brown.

Cooperative Campaign Outlines Christmas Plans

Plans for an elaborate Christmas merchandising campaign involving all branches of the electrical industry, especially the contractor-dealer and those branches actively engaged in retailing electrical appliances, are being perfected by the California Electrical Cooperative Campaign. At the last meeting of the Advisory Committee, held in Los Angeles, Oct. 1, a maximum of $3,000 was set aside for carrying out the campaign.

A committee consisting of C. C. Hillis, Electric Appliance Company, C. B. Chamblin, California Electrical Construction Company, and W. H. Woodward, Great Western Power Company, has been appointed to perfect plans for the campaign. Preliminary meetings have already been held in San Francisco and a definite announcement concerning the campaign will appear shortly.

A complete story covering all phases of the plan to give the electrical merchant his share of the Christmas trade will appear in the Nov. 15 issue of the Journal of Electricity.

Permit for Los Angeles Subway Subject of Application

An application for permission to construct and maintain a subway from Hill Street between Fourth and Fifth Streets in Los Angeles to Glendale Boulevard, has been made to the California Railroad Commission by the Pacific Electric Railway Company of Los Angeles. The company has already acquired all of the right-of-way for the construction of the subway, with the exception of two lots and condemnation proceedings have been set for trial on Nov. 16 on these pieces of property.

The City Council of Los Angeles has given the street railway company a franchise for the construction of the tunnel and the line of the railway. The purpose of the subway is to reduce traffic congestion in the center of Los Angeles. A number of trains serving the outlying sections of the city would use the subway and would in this way remove considerable traffic from the surface lines.

The Western Irrigation Equipment Association will hold its quarterly meeting in San Francisco on Oct. 17. C. A. Utley of the Pelton Water Wheel Company is president of the Association.

Second Unit Is to Be Added to Wired-Wireless System

A new sending and receiving station to be used in connection with the wired-wireless system of the Pacific Gas and Electric Company, will be installed at the Claremont substation of the company. The communication system is used by the dispatching department of the company in keeping in touch with operators at Pit No. 1 Power House, a distance of 260 miles from the Claremont station.

This station will be operated by remote control from the company's office in Oakland. The system is extremely valuable during stormy weather as communication can be maintained when telegraph and telephone wires would be down. The company has been using the present system between Pit No. 1 and the Vaca-Dixon Substation since the new power house was put on the line.

Western Spirit Is Carried East By Los Angeles Men

The bad man of the West has disappeared with the advance of civilization and culture but he has left an indelible trace on the records of the past. The cowboy who has for decades roamed the plains on his pinto or mustang, clad in picturesque chaps and sombrero, is giving way to modernism.

The history of the past, however, is frequently reviewed by those who would keep it fresh in the minds of newcomers and reference to its characters is always appealing. When the Illinois Electric Company held its Tenth Year Convention at Chicago several of the members of the Los Angeles branch went East to attend. To impress their eastern associates with the spirit of the West and to show the real live-wire spirit of the Los Angeles organization, all the members were arrayed in true cowboy style including even the famous bandana and the almost extinct sombrero.

Recalling the days of the James brothers and the passing of the old-time cowboy, the members of the Illinois Electric Company's Los Angeles sales force arrayed themselves in true pioneer style when they attended the Tenth Year Convention of the company at Chicago.

High Voltage Operation Discussed at Convention

Engineers of International Reputations Present Papers at Pacific Coast Meeting of A.I.E.E. at Del Monte

Delegates attending the annual Pacific Coast convention of the American Institute of Electrical Engineers at Del Monte, Calif., Oct. 2-5, 1923, have characterized the meeting as the most successful in the history of the organization. The registration was in excess of 250 and there was an average attendance at all sessions of 175.

The presence of many engineers of international reputation gave the convention a national aspect. Harris J. Ryan, president of the Institute and an authority on high voltage transmission, Dr. C. P. Steinmetz and J. L. R. Hayden, General Electric Company engineers, and Frank G. Baum were among the notable engineers who gave papers and addresses.

The papers were collectively good, dealing largely with questions of high voltage transmission, insulation, transformers and other apparatus. The discussion was lively and many interesting points were brought out. Long distance telephony and carrier current telephony were also discussed.

One of the important features of the convention was the address on "Some Factors in the Power Problems of the U. S. A." by Frank G. Baum, consulting engineer of San Francisco. Mr. Baum bemoaned the efforts which municipal ownerships propagandists are making to tear down the highly economical power generation, transmission and distribution systems which the private agencies have built up during the past three decades. He declared that such action would hinder the industrial and social development of the country if continued.

The feature of the annual banquet was the presentation of the Edison Medal to Dr. R. A. Millikan of the California Institute of Technology for especially meritorious achievement in the field of electricity. The presentation address was made by Dr. Frank B. Jewett, past president of the Institute, from New York City over long distance telephone. Dr. Jewett eulogized the work of Dr. Millikan and declared that the Edison Medal is the highest award which the electrical engineers of America can pay to anyone. He outlined the work of Dr. Millikan which brought about the award of the medal, placing particular stress on his efforts in the scientific education of the younger generation. Dr. Millikan responded in the chief address of the evening. He spoke at great length on the importance of scientific research to civilization.

In the annual golf tournament Paul M. Downing and S. J. Lisberger, both of the Pacific Gas and Electric Company, tied for the John B. Fisken cup. In the playoff, Mr. Lisberger won. W. G. Vincent, Jr., of the Pacific Gas and Electric Company, took third prize in the tournament. In the Kicker's Tournament, Mr. Downing took first honors.

Great interest was displayed in the post-convention trips, especially to the Big Creek plants of the Southern California Edison Company. A total of 52, all that could be handled, visited Big Creek. A trip around the substations adjacent to the San Francisco Bay region was enjoyed by a large number of delegates, while others visited the Pit River development of the Pacific Gas and Electric Company.

At the last session a memorial resolution to John A. Britton was passed. It was voted to hold the 1924 Pacific Coast convention at Pasadena with the Los Angeles Section as host.

Farley Osgood's nomination for the presidency of the Institute for the year 1924-25 was seconded in a petition which was informally circulated among the convention delegates. This action was taken in view of Mr. Osgood's withdrawal from the nomination last year, when Harris J. Ryan, western engineer, was a candidate for the position.

Eighty-five Per Cent of Work on Skagit Plant Completed

C. H. Uhden, chief engineer of the City of Seattle's Skagit project, recently announced that the power house at Newhalem was 85 per cent complete. Three units, each of 37,500 hp., will ultimately be placed in the power house, but only the first unit will be completed immediately. It is expected that the first unit will be ready for operation early in 1924.

Power will be transmitted 125 miles to Seattle over a transmission line which is being constructed by the city. The work of installing the second unit will be started as soon as power demands warrant.

The Puget Sound Power & Light Company's new power line between Tenino and Olympia, Wash., has been completed, and a connection established between the Puget Sound system of the company and the lines of the North Coast Power Company, recently purchased by the Puget Sound company.

Application for Huge Project in Arizona Is Filed

The Arizona Highline Reclamation Association recently filed with the Arizona state water commissioner an application for water and power sites for the irrigation of 3,500,000 acres of land in the state. An engineering committee also reported to Governor Hunt, of Arizona, that a high-line canal had been found feasible from a dam located below Spencer Canyon. This dam would be about one hundred and fifty feet in height. The plan provides for tunnels through several mountains and flumes across several rivers.

It is the proposal to construct a high-line canal 500 miles long and 155 miles of lateral canals leading to the center of distribution so that the 3,500.000 acres could be reached. Water would be diverted at an elevation of 2,000 ft. The estimated cost of the project is approximately two hundred and eighty million dollars.

The engineers' report states that there is available power in excess of one million horsepower, but that it is advisable to recommend the develop- of about seven hundred and fifty thousand horsepower as part of the initial construction.

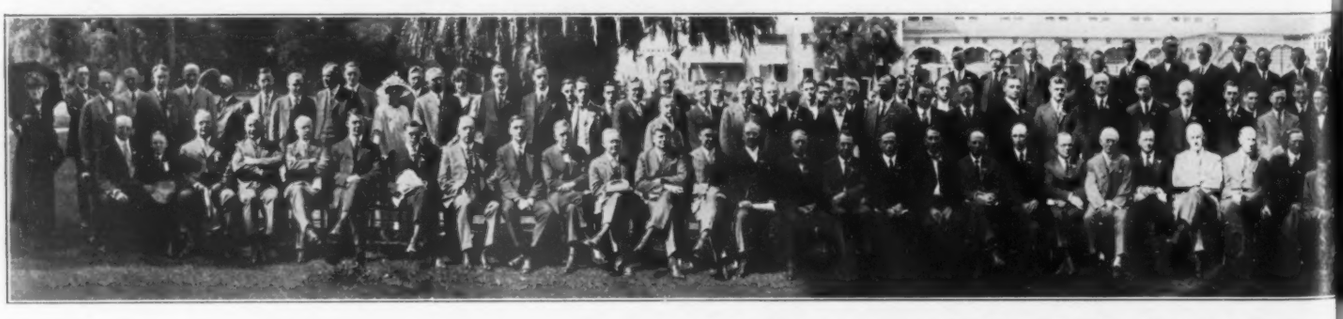
Radio Aids in Announcing Sciot Convention at San Diego

To give the greatest possible publicity to the annual convention of Sciots in San Diego in November, the electrical men of the order contrived to arrange for a nation-wide broadcasting of the news. Arrangements were made with the Los Angeles Times radio station for the handling of the entire day's program on Sept. 29. San Diego talent gave the five programs broadcasted throughout the day.

Arrangements were made by the Weathers Electric Motor Shop and electrical men of San Diego. Receiving sets were also set up in San Diego by some concerns for the benefit of local people.

"Give Something Electrical" will be this year's Christmas slogan in local and national newspaper advertising, replacing the slogans of past years—"Make This an Electrical Christmas" and "Say Merry Christmas Electrically."

Plans have been completed for the construction of another automatic substation by the Public Service Company of Colorado at 39th and Columbine Streets in Denver, Colo. A building permit for the superstructure has already been issued by the city.



Members of the American Institute of Electrical Engineers in attendance

Giant Electric Hoist Is Built for Lumber Company

A gravity incline electric hoist, weighing 320,000 lb., costing $60,000 and declared to be the largest hoist of its kind ever manufactured, has recently been completed for the Yosemite Lumber Company by the Llewellyn Iron Works of Los Angeles, Calif. The hoist will be used on a mountain at El Portal.

The hoist is of the double drum gear type and will lift a load of 130,000 lb. up an incline varying from 10 to 70 degrees. It has a rope pull of 80,000 lb. When used in lowering logs it will operate at a speed of 1,300 ft. per minute and in the hoisting of heavy machinery reduction gears are used to secure a speed of 250 ft. per minute. Two Westinghouse Electric & Manufacturing Company, 200-hp. slip ring motors are used to furnish power for the hoist.

Current to operate the hoist will be furnished by the San Joaquin Light & Power Corporation. By installing the hoist the company saves the construction of 18 miles of railroad, on parts of which it would be necessary to have a grade of 6 per cent.

Salt Lake City Merchants Enter Window Dressing Contest

To induce the merchants of Salt Lake City to appreciate the value of well-dressed display windows, a contest was held in that city from Oct. 4-5 to determine which merchant had the best decorated windows. Prizes amounting to one hundred dollars were awarded to the four merchants having the best window displays.

The judges based their decision upon the pulling power of the windows and upon the sales value that the displays had. The preliminary announcement stated that "matters of goods displayed, color arrangement, balance, background, unity of appeal, timeliness and evenness of illumination will play a part in the decision."

The window dressing contest was held under the auspices of the Inter-Mountain Retailer. The Rocky Mountain Electrical Cooperative League aided in promoting interest in the affair.

Coronado Is Installing Modern Street Lighting System

The City of Coronado, Calif., without ostentation or opposition, apparently, has instituted a campaign of street lighting through the use of ornamental light standards. Present plans call for the lighting with single light, 400-cp. lights placed on each side of Orange Avenue, the main business street of the beach city. Lights are also to be run from the business center to the ferry landing from San Diego.

A city of exclusive and expensive residences, many of the residence streets are asking for extensions of the system to residence districts. The city council of Coronado is proceeding under a plan whereby the lights are ordered in by the council without awaiting petitions from districts, protests being heard according to regular process of law.

The new street lighting system installation has been facilitated by the recent rebuilding of the entire electric lines in Coronado by the San Diego Consolidated Gas & Electric Company, which bought the United Light, Power & Fuel Company's system last year.

Application for Power Projects on Umpqua River Filed

Application for a preliminary permit has been filed by The California Oregon Power Company covering the proposed power development on the North Umpqua River. The projects considered embrace practically the entire river.

The first site is at Lemola Falls near Diamond Lake where the river plunges over a high cliff giving an excellent site for a large power plant. The second project is at Toketee or Ireland Falls. The third and fourth sites are adjoining and take in all the river from Steamboat Creek to Idlyld Park. The company is to put its engineers to work at once.

Books and Bulletins

ELECTRIC VIBRATION INSTRUMENTS

By A. E. KENNELLY. Published by the Macmillan Company, New York. 450 pages, 214 figures, 29 tables.

This textbook covering the behavior and tests of telephone receivers, oscillographs, and vibration galvanometers covers in a thorough and detailed manner the results of various experimenters in this field.

The greater portion of the book is a treatment of that wonderful and rugged instrument, the Bell telephone receiver. Little information has heretofore been readily available concerning the properties of the telephone receiver as a machine and it is the author's object to present, from an electrical engineering standpoint, the characteristics of the telephone receiver as a reciprocating electric motor.

A notation of some of the contents of this textbook will indicate the thorough manner in which the subject has been treated. A few of the chapter headings are: The Permanent Magnet of the Receiver and Its Functions, Equivalent Mass of a Diaphragm Vibrating on Its Fundamental Mode of Vibration of a Telephone Diaphragm, Impedance of Telephone Receivers and Its Measurement, Acoustic Impedance, and Influences that Affect the Constants of a Receiver.

To quote from the author—"The central idea in the preparation of the material for this book has been the wonderful and fascinating analogy between the laws of mechanics for a simple vibrational system, and the laws of electromagnetics for a simple alternating current or oscillating-current system."

The technique of experimentation on telephone receivers as well as the analysis of and conclusions from such experiments is an outstanding feature of the book. For this reason it should prove an excellent textbook for students of telephone engineering as well as a reference book on the subject of the receiver for telephone engineers.

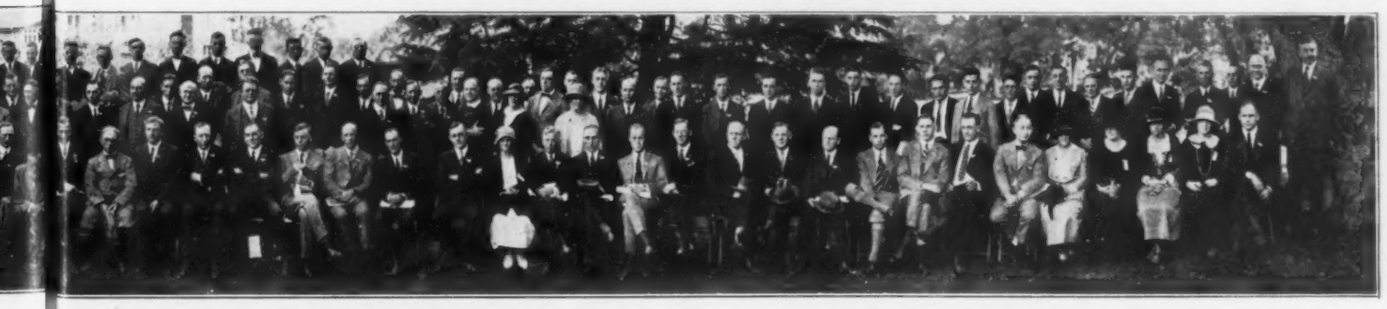
Th latter portion of the book is devoted to a study of the oscillagraph and the vibration galvanometer. The chapter covering oscillagraph meters, a device for measuring the constants of an oscillagraphic vibrator and its resonant frequency, is of particular interest to anyone engaged in investigations with the oscillagraph. The methods of testing and the conclusions to be obtained from such tests are treated in detail.

A little less than one quarter of the book is devoted to an appendix wherein a detailed mathematical treatment of the subject is given. Also five pages covering a rather complete bibliography is included at the end of the book.

The author is to be congratulated for making available in such an excellent text information which should be of value to telephone engineers, research workers, and students of this branch of electrical engineering.

E. R. S.

The Roller-Smith Company, New York, N. Y., has published Bulletins No. 450 and 560 dealing with alternating current switchboard instruments and "Safety" circuit breakers, respectively. The first bulletin contains illustrations and complete descriptions of the ammeters and voltmeters, wattmeters, frequency meters and power factor meters manufactured by the company. Included in this bulletin is a description of the new type LIDA wattmeter which is designed for use in class rooms. The dial is visible from a considerable distance. Bulletin No. 560 presents a description of types P and E enclosed circuit breakers.



at the Pacific Coast Annual Convention at Del Monte, Calif., Oct. 2-5, 1923.

Meetings

San Diego Schools to Cooperate with Electrical Men

A pledge to support the vocational education and guidance plans of the San Diego city schools was given to Henry C. Johnson, city superintendent of schools, when he talked before the Electric Club of that city at its regular noon meeting, Oct. 2. The plan is to have instructors from the high schools meet with committees of the Electric Club to discuss ways of making the courses thoroughly up-to-date and practical from an industrial standpoint. Students taking electrical courses will be sent to receive interviews on some of the practical aspects of their courses with electrical men of the city, it was also promised.

Mr. Johnson gave an instructive talk before the Electric Club, detailing the methods employed in the city high schools to promote educational training of youths who would not for many reasons be able to go on to colleges. "It seems to me that schools must organize to do high-class skilled work," he said. Direction of student reading along vocational lines, fitting courses to pupils rather than pupils to arbitrary courses, and vocational civics were described as the methods employed. Breaking down prejudice against manual labor was one of the most important things accomplished, he pointed out.

Mr. Johnson at the close of his talk asked the cooperation of the club in vocational training of students, which was extended to him on behalf of the club by "Jess" Zweiner, the president. A. E. Holloway had charge of the program of the day in the absence of Walter Wurfel and the next meeting program was assigned to G. H. P. Dellman.

The death of an active worker in the club, Walter Draper, on Sunday, Sept. 30, was announced by President Zweiner. Sydney Gaines, in charge of the electrical department of Whiting-Mead, was introduced as a guest in the meeting.

At the previous week's meeting of the club, held on Sept. 25, and attended by 40 members, a great deal of enthusiasm was shown and the year begun in earnest with considerable discussion of the reasons why the club should plan regular weekly programs. Walter Wurfel, Al Schrieber, Harry Dietrich of the Baker-Joslyn Company, Los Angeles; K. A. Macomber; C. C. Clardy, W. H. Talbott, and President Zweiner spoke in favor of continuing weekly programmed meetings. On being assured that this plan met with greatest favor President Zweiner appointed Fay Smalley chairman of the program committee and assigned the first program to Walter Wurfel. P. P. Pine, secretary-treasurer of the club, also urged cooperation with the committee.

An increase in membership of 15 with a like number of prospects was announced. Guests of the day were A. E. Mason, new superintendent of equipment for the electric railway company, W. A. Hillebrand of the Ohio Brass Company who was in San Diego to supervise the construction of a caternary overhead system on the street railway, and A. R. Whisler, of the San Diego Consolidated Gas & Electric Company. Wm. A. Cyr was appointed in charge of club publicity.

A description of the work involved in the establishing of telephonic communication between the United States and Cuba was presented to members of the Denver, Colo., section of the American Institute of Electrical Engineers at a meeting held at the Adams Hotel in Denver on Sept. 21. H. S. Osborne, transmission engineer of the American Telephone & Telegraph Company of New York, N. Y., was the speaker of the evening.

Memorial services in honor of the late John A. Britton, former vice-president and general manager of the Pacific Gas and Electric Company, were held on Oct. 7, in each of the principal towns served by that company. The services were held under the auspices of the Pacific Service Employees' Association.

N.E.L.A. Electric Truck School Held at San Francisco

Realizing that the establishment of an electric vehicle bureau increases the possibility of service to the community and at the same time makes for increased revenue to the central station, the Pacific Gas and Electric Company in cooperation with the National Electric Light Association has established such a bureau and has, in addition, held an electric truck school.

Invitations were extended to other central station companies to attend and these invitations were gladly accepted. The purpose of the school was to discuss the problems surrounding the development of electric vehicle business and to develop the sales abilities of the men concerned.

The officers in charge of the school were E. J. Power, director, Transportation Bureau, Pacific Gas and Electric Company, San Francisco, Calif., dean; E. S. Mansfield, superintendent, Operating Bureau Accounts department, Edison Electric Illuminating Company, Boston, Mass., chairman of the faculty; Charles R. Skinner, Jr., manager, Automobile Bureau, New York Edison Company, New York City, vice-chairman; Horace S. Meese, transportation consultant, Commercial Truck Company, Nicetown, Philadelphia, Pa., secretary.

The school course included the discussion of motive equipment, trucks and accessories, batteries, garaging, city deliveries and transportation engineering. The school lasted 6 days—Oct. 8-13—and was well attended. Discussion of the various problems was conducted by the men who have specialized on these matters and full sales information was given, as was also the technical information necessary for the intelligent development of electric vehicle business.

COMING EVENTS

California Industries Exposition—
Exposition Auditorium—San Francisco, Calif.
Nov. 17-Dec. 2, 1923

New Manufacturers' Division of Denver League Formed

The permanent organization of the manufacturers' division of the Electrical Cooperative League of Denver, Colo., was complete on Oct. 2. Harry Randall, district manager of the General Electric Company, was elected chairman of the division and L. J. Bridger, of the merchandising department of the Westinghouse Electric & Manufacturing Company, was named vice-chairman. F. J. McEniry, field representative of the League, was chosen secretary of the division.

Meetings of the division will be held the first Tuesday evening of each month, the next meeting to be held Nov. 6. It was decided that the division would endeavor to render further assistance to the League in the maintenance of its information bureau, by the completing of the League's files of catalogs and data books. As a further means of developing close relationship between architects and the electrical manufacturing interests, and thereby widening the scope of the Electrical Cooperative League's educational activities, members were urged to mail suggestions to the secretary of the newly formed division and that these be presented for discussion at the next meeting.

The following manufacturers were represented at the organization meeting: Decorative Art Shops, J. E. Bullock; Commercial Switchboard Manufacturing Company, A. H. Cook; General Electric Company, H. D. Randall; Automatic Electric Washer Company, John J. Crowe; Hazard Manufacturing Company, E. P. Kipp; Bryan-Marsh Division, National Lamp Works, H. W. Coombs; Economy Fuse & Manufacturing Company, F. L. Easton; Alex Hibbard, Inc., H. A. Hibbard; Hubbard & Company, M. M. Johnson and Earl Wessel; National X-Ray Manufacturing Company, R. D. Thomas; Albert Sechrist Manufacturing Company, R. W. Elliott; B. K. Sweeney Electrical Company, H. W. Fishburn; Mountain States Machinery Company, N. C. Olin; Westinghouse Electric & Manufacturing Company, L. J. Bridger.

Commercial Section Meeting to Be Held at Fresno

The meeting of the Commercial Section of the Pacific Coast Electrical Association has been called and will be held at Fresno, Calif., Oct. 19-20. There will be meetings of the various subcommittees including the following:

Competitive Power
Commercial Lighting
Industrial Heating
Sign Lighting
Street Lighting
Central Station Activities
Allied Industries
Commercial Trucks
Batteries
Appliance Sales
Ranges and Water Heaters.

The executive committee meeting is called for eight o'clock on the morning of Oct. 19 and, together with all meetings, will be held at the Fresno Hotel.

Manufacturer, Dealer and Jobber Activities

The Baker-Joslyn Company has recently moved its San Francisco office to its new building located at Second and Bryant Streets in that city. The new location is convenient to the wholesale district and also to shipping facilities. The concern's telephone number remains unchanged.

The Wells-Morris Company, of San Francisco, Calif., has brought out a new commercial type electric waffle iron. The base is of attractive appearance, being finished in vitreous white enamel with back plate of the same material. The switch positions are marked on the back plate. Two irons are mounted on one stand and each iron consumes 660 watts at high heat. Three heat control is provided. An important fact in connection with this iron is that it may be used on ordinary lighting service wiring.

The Russell Electric Company, Chicago, Ill., has recently placed on the market a six-cup aluminum percolator. The new percolator will be known as one of the Hold-heet products.

The General Electric Company has published Bulletin No. 47635 which deals with types PQ-25 and PQ-26 under-voltage relays. These relays provide protection to apparatus from damage caused by sudden return of supply voltage after its failure or reduction. The relays are used for tripping electrically operated circuit breakers when the voltage has been decreased to a certain predetermined value; for automatically disconnecting motors on undervoltage, thus preventing them from restarting unexpectedly on return of voltage with possible damage to driven machines, and in any case where it is desirable to operate an auxiliary circuit on the occurrence of a decrease in voltage. The type PQ-25 is for single-circuit control while the type PQ-26 is for two-circuit control.

The Packard Electric Company, Warren, Ohio, has recently broken ground for a new factory at Warren. The new factory is expected to be ready for occupancy about the first of January. A considerable amount of alteration work will be done on the present plant and this together with the addition will approximately double the capacity of the transformer manufacturing concern. The addition will cost in the neighborhood of $350,000.

The Electric Fireplace Sales Company, Chicago, Ill., has recently placed on the market a new fire-place heater known as the Ruby Coal Electric Fires. The device is designed to present the appearance of a standard coal fire basket and can be so regulated that it either gives the appearance of giving off heat or actually does give off heat. The device is rated at 660 watts when the heating element is attached and at 120 watts when only the lighting elements are in operation. Electric lamps illuminate the Ruby Coal when only an ornamental effect is desired.

The F. W. Wakefield Brass Company of Vermilion, Ohio, has prepared a broadside which gives additional figures on results secured from recent kitchen lighting campaigns. The company is the manufacturer of "Red Spot" hangers.

The Century Electric Company, St. Louis, Mo., has published a net retail price list, effective Oct. 1, 1923, covering the company's line of squirrel cage induction polyphase motors. The company has also prepared a delivery charge sheet effective the same date.

Benjamin Electric Manufacturing Company, Chicago, Ill., has recently announced that it will conduct a prize contest among electrical dealers during the week of Oct. 24-31. The contest is to be one which will be judged upon the attractiveness of the window displays that the dealers present. The rules of the contest state that the window trimming material furnished by the company must be used and that the displays are to feature the Benjamin two-way plugs. First prize will be $100, and thirteen other prizes will be awarded. Dealers can secure the window trimming material by writing the advertising department of the company. All photographs of windows must be in the company's offices by Nov. 10. Jobbers' salesmen will also be entitled to receive prizes as the company has offered four prizes to be awarded to the salesmen who turn in the greatest number of entrants who use the window trim and submit a photograph.

If V. L. Board and D. C. McClure, of the Denver Gas & Electric Light Company, had been driving an electric vehicle instead of the universal pest they would not have been put to the indignity of making repairs under the public gaze on Champa Street in Denver, Colo.

The Reliance Electric & Engineering Company, Cleveland, Ohio, has recently published the fourth edition of Bulletin No. 2014. This booklet is devoted to the description of the type T heavy duty Reliance motors for direct current. The booklet presents illustrations of the motors and of the component parts thereof. An interesting description of the processes of manufacture is also contained in the bulletin. The usual rating and specification tables are made a part of the bulletin. Illustrations of typical installations show the wide variety of application that is possible with the motors.

The Ward Leonard Electric Company, Mount Vernon, N. Y., has developed a very simple method for charging automobile storage batteries, by means of a 32 to 40-volt plant. Vitrohm resistor units are used in the work. These units are of the standard Ward Leonard Vitrohm construction, the resistance wire being wound on a porcelain-like tube and then enveloped in a coating of vitreous enamel. The tube has a standard lamp base which fits in any standard porcelain receptable and one unit is sufficient for charging any battery up to three cells. One or more units can be assembled on a heat resisting base and connected on the line.

The Coast Equipment Company, of San Francisco, has moved from 706 Folsom Street to 85 Columbia Square, between Folsom and Harrison Streets. The company specializes in industrial engineering work and is the factory representative for a number of eastern manufacturers. The concern has the sole agency for Ridgway turbo-sets, London small turbines, Burke induction motors, Jeannin single phase motors, Hopewell moulded insulation, Franklin bus bar supports, Duncan meters, Federal spot and butt welders, Western transformers, Burke arc welders, Pittsburgh electric furnaces and the line manufactured by the States Company of Hartford, Conn.

The Atlantic-Pacific Sales Company, San Francisco, Calif., has been appointed sales agent for the Wells-Morris Company, San Francisco.

The National X-Ray Reflector Company, Chicago, Ill., has recently published three new bulletins for the trade. These circulars are known as Serials 427, 428 and 429. The first folder contains descriptions of the three new reflectors designed for 50-watt mill type Mazda B lamps. Bulletin No. 428 is devoted to a description of the "Hippo" reflector and the show window flood light No. 33. The third bulletin is devoted to the illumination of office and manufacturing plants.

The Apex Electrical Distributing Company, Cleveland, Ohio, has recently announced that Mrs. Jane Carroll has been appointed to head the company's new home economics department. Mrs. Carroll has been considered as one of the leading home economic experts of New York City and has established for herself a reputation as a teacher and writer on home electrical subjects. Her first work with the company will be to travel around the country and educate the various district managers on the merits of the Apex company's latest appliance, the Rotarex electric Kook-Rite. Later she will conduct an electrical housekeeping school for the exemplification of better methods of cleaning, washing, ironing and cooking.

The Mitchell-Rand Manufacturing Company, of New York, N. Y., has recently published a new catalog, known as No. 423. The new publication resembles a handbook more than it does a catalog, because of the variety of material that is contained therein. The handbook is entitled "Everything in Insulation," and in describing the various products manufactured by the company gives a list of the uses of each product as well as a statement of the requirements that must be met in preparing the particular article. A number of miscellaneous tables appear in the back of the book and together with the rest of the information that is presented should prove quite useful to contractors, motor repair men, as well as central station men.

Personals

Guy W. Faller, since 1913 vice-president and general manager of the City Light & Water Company, Amarillo, Texas, has been appointed assistant

GUY W. FALLER

general manager of the Denver Gas & Electric Light Company and has already assumed his new duties. He was formerly with the Denver company, having served as assistant foreman of the street department, engineer of the gas distribution department, and then as assistant superintendent of the gas and street department until his transfer to Amarillo in 1905 as general superintendent of the company. As a native of Wisconsin he was appointed to the United States Naval Academy in 1894 and graduated with the class of 1898 just in time to take an active part as an engineer officer in the Spanish-American War and Philippine Insurrection. He resigned from the navy in 1903 to become the operating engineer of the Madison (Wis.) Gas & Electric Company and remained there until his first transfer to Denver by Henry L. Doherty. During the World War, he was one of the leaders in war work activities at Amarillo as campaign manager of the first Red Cross roll call and Third Liberty Loan drive and treasurer and manager of the United War Work campaign. While in Amarillo he also served one term as president of the local Rotary Club. During the existence of the Amarillo Street Railway Company he served as vice-president, general manager, federal receiver, and special master of the company.

F. H. Murphy, illumination engineer, Portland Railway, Light & Power Company, Portland, Ore., was recently in San Francisco. Mr. Murphy was also present at the convention of the American Institute of Electrical Enineers at Del Monte.

Otto Jeancon, who had been in charge of the El Centro branch—since sold out—of the Southern Electric Company, became sales manager of the concern as Earl D. Myers left, taking charge in this new position of the appliance and other departments.

Carl D. Luscomb, for several years assistant to C. A. Semrad, vice-president and general manager of the Western Light & Power Company which was recently merged with the Denver Gas & Electric Light Company to form the Public Service Company of Colorado, has been appointed general superintendent of the division operated by the former company and will continue to make his headquarters at Boulder, Colo.

William Shannon, of the Seattle office of Stone & Webster, has been transferred to the San Francisco office of that company. Mr. Shannon is well known as an engineer in the Northwest.

L. A. Osborn, president of the Westinghouse International Company, and **Guy E. Tripp,** chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, arrived in San Francisco early in October on their way to Japan and sailed on Oct. 10. They will assist in the problem of reconstruction of electrical enterprises in that country and will be guided in their plans to a considerable extent by the California development which can be used as a basis for the rebuilding of Japan's electric system. From Japan Mr. Tripp and Mr. Osborn will go to China and India before returning to this country.

O. N. Toomey, of the General Electric Company, Portland, Ore., was a visitor to San Francisco recently during the visit of Dr. Steinmetz.

K. G. Rennie, of the Chicago Electric Sign Company is a recent visitor to San Francisco.

W. C. North, of the General Electric Company, was recently in San Francisco, coming from the general headquarters at Schenectady.

A. D. Stewart has been appointed branch manager of the Butte office, Westinghouse Electric & Manufacturing Company, succeeding **R. J. Cobban,** who has been transferred to the Seattle office. At Seattle Mr. Cobban will give special attention to mining activities.

L. C. LaMont has been appointed office manager of the Los Angeles office, Westinghouse Electric & Manufacturing Co., succeeding **J. R. Deering** who has resigned.

Harry L. Barker, general manager of the Meadows Manufacturing Company, recently spent some time on the Coast visiting the various concerns which distribute his goods.

S. F. Snow, Graham-Reynolds Elecaric Company; **C. E. Listenwalter,** Listenwalter & Gough; **R. L. Hutchinson,** Brown & Pengali; **L. D. Ingam,** Electric Lighting & Supply Company and **Anson H. Rees,** Illinois Electric Company, were among the Los Angeles electrical men who attended the Convention of the Pacific Coast division of the National Association of Purchasing Agents. The motto of the association is "Our purchases are $2,000,000 annually. Do you get your share of it?"

C. R. Dodge, of Dodge Brothers Electric Company, Salt Lake City, Utah, has returned from an extensive trip East during which he visited several equipment factories. He reports a very pleasant trip.

Fred Mulvaney of the Pacific States Electric Company, Portland, Ore., was a visitor in San Francisco while en route to the convention of the American Institute of Electrical Engineers.

John Werner has been made manager of the household goods department of the White House, San Francisco, Calif. Mr. Werner will have charge of the sales of electrical appliances and supplies for his firm.

A. E. Everett, of the General Electric Company, Schenectady, N. Y., was in San Francisco recently while on his way to the convention of the A.I.E.E. at Del Monte.

F. R. Lack, an engineer of the International Western Electric Company, has received notice that the Emperor of Japan has bestowed upon him the sixth class of the Imperial Order of the Rising Sun. The award is in recognition of his services in connection with the installation of the first printing telegraph in Japan.

R. R. Easter, of the North Coast Power Company, Hillsboro, Ore., was among the electrical men of the Northwest who attended the convention of the American Institute of Electrical Engineers at Del Monte. Mr. Easter also spent a few days in San Francisco on his way home.

Clark R. Jackson, formerly state commissioner of Washington, has been appointed superintendent of public utilities of Seattle by Mayor E. J. Brown.

A. E. Holloway, superintendent of the commercial department, San Diego Consolidated Gas & Electric Company, San Diego, Calif., is the new chairman of the Commercial Section of the Pacific Coast Electrical Association. Mr. Holloway was born in Colfax, Ind., and received his early education in Logansport. In 1909 he graduated from Purdue University with the degree of Electrical Engineer. Shortly after graduation he joined the staff of the Westinghouse Electric & Manufacturing Company and in 1910 was sent to San Diego. In February of that year he became new

A. E. HOLLOWAY

business solicitor for the San Diego Consolidated Gas & Electric Company and later in the year was made superintendent of new business. Some time after appointment to this position he was made superintendent of the commercial department and has since held that position. Under his direction the commercial department of his company has made notable progress.

H. C. Barnard, of the National X-Ray Reflector Company, San Francisco, Calif,. was a recent visitor to Salt Lake City, Utah.

C. R. Bach, western representative of the Manhattan Electrical Supply Company, San Francisco, Calif., was a recent visitor to Salt Lake City.

Geo. R. Shuey, with the Department of Public Service of the City of Los Angeles, Calif., has been transferred from Fresno, Calif., to Independence, California. At Fresno Mr. Shuey had charge of the city's power interests on the Kings River. In his new position he will direct the water development program of the city in Owens Valley.

R. R. Robley, operating engineer of the Portland Railway Light & Power Company, left Portland recently for the Schenectady works of the General Electric Company, where he will spend six months in the study of engineering problems. Mr. Robley was chosen by the Portland company to represent it on an exchange of engineers plan, by which the two firms exchange two engineers for six months, the two men remaining on the pay-rolls of their respective companies. R. M. Rankin of the Lighting Engineering department at Schenectady will spend six months in Portland devoted to the study of the problems of the Portland company. It is believed that much good will result from this arrangement. Mr. Robley will soon be a candidate for the Portland Railway Light & Power Company's Twenty Year Club, having been in continuous service since 1904. He is a western man, born in Walla Walla, Wash., and educated in western schools. After receiving an electrical engineering degree at the University of Oregon in 1901 he spent some three years in electrical construction. His first job with the Portland General Electric Company (one of the predecessors of the present company) was as a construction man at the time that Station E steam plant was built. When the Cazadero hydroelectric plant went

R. R. ROBLEY

in Mr. Robley had charge of the electrical work and in 1910 was made operating engineer, which position he still holds. He has held various positions in American Institute of Electrical Engineers and National Electric Light Association affairs, including the chairmanship of the apparatus committee of the Northwest section of the National Electric Light Association.

Ralph A. Hopkins, manager of the engineering division of the Los Angeles, Calif., office of the Westinghouse Electric & Manufacturing Company has recently left on a trip to Chicago, East Pittsburgh, New York and other cities, visiting the various factories of his company.

Robert Miller and **H. T. Plumb,** of the General Electric Company, were among the eastern men in attendance at the Glenwood Springs, Colo., convention of the National Electric Light Association.

Earl D. Myers, for twelve years with the Southern Electric Company of San Diego as manager of the appliance department, left the employ of that concern on Oct. 6 to enter into a retail merchandising business for himself. His establishment is situated in a new business center rapidly growing up in that city, near 30th and University Streets. Mr. Myers plans to do only a retail electrical business in his new venture.

W. W. ("Duke") Spangler, assistant manager of syndicate operations of the Westinghouse Electric & Manufacturing Company in its New York office, was a recent visitor to Seattle, where he visited his brother, J. W. Spangler, president of the Seattle National Bank. Mr. Spangler was formerly treasury representative of the Seattle branch of the company.

George T. Bigelow, assistant general agent, The Southern Sierras Power Company, Riverside; **H. H. Courtright,** Valley Electrical Supply Company, Fresno; **R. E. Fisher,** vice-president in charge of public relations and sales, Pacific Gas and Electric Company, San Francisco; **C. C. Hillis,** president and treasurer, Electric Appliance Company, San Francisco; **W. S. Berry,** manager, Western Electric Company, San Francisco; **F. H. Woodward,** general sales manager, Great Western Power Company, San Francisco; **Don Ray,** manager, bureau of public relations; Pacific Gas and Electric Company, San Francisco; **R. A. Balzari,** manager, industrial division, Westinghouse Electric & Manufacturing Company, San Francisco; **Tracy E. Bibbins,** president, and **Dave E. Harris,** vice-president and sales manager of the Pacific States Electric Company, San Francisco; **Roscoe Oakes,** Pacific Coast manager, National Carbon Company, San Francisco, and **A. Emory Wishon,** vice-president and manager, San Joaquin Light & Power Company, Fresno, were among those who were in Los Angeles to attend the October meeting of the advisory committee of the California Electrical Cooperative Campaign.

L. F. Blum, of the General Electric Company, Pittsfield, Mass., is a recent visitor to San Francisco, having stopped there on his way to the convention of the A.I.E.E. at Del Monte.

R. C. W. Libbey, of the Simplex Electric Heating Company, Cambridge, Mass., is conducting an intensive sales campaign in southern California.

Vladimir List, professor of electrical engineering, Brno Technical University, Czechoslovakia, was in attendance at the convention of the American Institue of Electrical Engineers at Del Monte. Professor List also attended a meeting of the San Francisco Electrical Development League and gave a short talk on his impressions of America and American electrical development.

Grover Anderson, recently appointed sales manager of the Electric Appliance Company, San Francisco, Calif., was born in Omaha, Neb. He was educated in the schools of that city until 1905 when he moved to San Francisco and continued his schooling there. In 1907 he joined the sales force of the Electric Appliance Company and, with the exception of a few months, has been with that firm ever since. From 1912 until 1917 he traveled for his company and during the latter year he left for a

GROVER ANDERSON

few months, rejoining the firm in 1918 as assistant city sales manager. In 1918 he was made city sales manager which position he held until his appointment in 1923 as sales manager.

Obituary

Grant Smith, head of the contracting firm of Grant Smith & Company, died after a brief illness in St. Paul, Minn., on Sept. 27. Mr. Smith was 55 years of age at the time of his death. Mr. Smith, whose firm holds the contract for the erection of the new Hotel Olympic in Seattle, was one of the pioneer contractors of the West, but his construction activities extended to all parts of the United States. Included in his many constructional projects are the two pipe lines for the Seattle Cedar River water system; a considerable part of the Northern Pacific and Great Northern Railways through Washington, Montana and Idaho; many of the larger buildings in Seattle; a large part of the Catskill Aqueduct in New York; a portion of the New York subway system, and the U. S. Navy hangar at Lakehurst, N. J. Head offices were maintained in Seattle, with branch offices at various points throughout the United States.

J. E. Todd, superintendent of the Lamar (Colo.) municipal plant was murdered recently while on an automobile trip from Wichita, Kan. Mr. Todd was one of the most prominent electrical men in the state and his death will be felt by the entire industry. According to the authorities they have captured two young men of 18 and 21 years, respectively, who, it is claimed, have made a full confession.

Trade Outlook

San Francisco

Building continues in unusual volume and labor is well employed at the prevailing high costs.

Sales are generally satisfactory, particularly in furniture lines. Prices in these lines are somewhat lower than last year and volume exceeds that period. Fall merchandise movement has been delayed somewhat by warm weather but the undertone is firm.

Metal products and machinery are moving well. There have been some price reductions in metal products.

Bank clearings continue to increase and money is available at normal rates.

There have been several additions to the established electrical lines and dealers are buying in anticipation of holiday demand. Stocks are in good condition.

Los Angeles

Building continues active and permits to date are $56,000,000 ahead of the 1922 nine-month period.

The September imports and exports through the Port of Los Angeles were $569,383 in excess of the figures for the same month a year ago.

The continued growth of Los Angeles is shown from the earnings of the Southern California Edison Company and the Los Angeles Gas & Electric Corporation. The gross earnings for the calendar year 1923 of the former company should exceed the 1922 total of $16,982,225 by at least 15 per cent, while for the latter, the gross earnings for the year ended Aug. 31, were $12,198,728 as against $11,440,030 for the preceding year.

Manufacturers and wholesalers report excellent business conditions prevailing, whereas electrical retail dealers show a slight falling off for the month of September over the month of August; this is true of both electrical appliances and of radio; however, the fall outlook is very bright and retail business should pick up considerably during the present month.

Portland

Building permits in Portland increased 40 per cent, bank clearings 15 per cent, exports 5 per cent and postal receipts 7 per cent over September, 1922. A definite increase in retail buying is noticeable of late and the prospects for a record holiday trade are good.

Fall buying of lumber is heavy resulting in increased activity at the mills. Lumber shipments for the first nine months of the year to Pacific Coast ports were more than double the shipments of a year ago.

Considerable uncertainty exists among local interests regarding the effect of the Japanese disaster on the off shore commerce, particularly in lumber and grain. There have been some cancellations and others may follow. It is thought, however, that eventually these losses will be more than made up.

Sales of electric ranges are being pushed aggressively by power companies and dealers following the Oregonian Cooking School.

The weather continues favorable for all kinds of construction work. Labor has no difficulty in finding employment and there are strong indications of wage increases in the building trades.

Seattle

Japanese orders for lumber are earlier than expected and the initial order has been received for 80,000,000 ft. This business will react advantageously for all lines of trade. Lumber shipments from Pacific Northwest ports have already exceeded those of the same period of 1922 by more than 11 per cent.

Building continues active, with a number of new projects outlined during the past month, and there is renewed confidence in anticipation of continued prosperity. Money is becoming easier.

Retail business since the opening of fall buying has been gratifying, department stores report, and it is believed that sales totals will increase as the season advances. Collections are reported to be fair.

Electrical jobbers and dealers report a satisfactory fall business, with stocks in good condition, and market firm.

Spokane

Bank clearings for September show an increase of 8 per cent over those for August and 10 per cent higher than for September, 1922. The total clearings for the first nine months of 1923, were nearly 10 per cent higher than for the same period in 1922. This general increase corresponds to the improvement in lumbering, mining, agriculture, horticulture and stock raising.

The wheat and fruit crops of the Inland Empire are being moved satisfactorily.

A "Home Exhibition Week" will be held Oct. 15 to 20, in Spokane, under the auspices of the Realty Board and it is expected to stimulate interest in building, which has been rather low this year. The Western Pine Manufacturers' Association report shows a 10 per cent increase in cut over August, 1922.

On account of the low price for zinc, one of the large producing mines in the Coeur d'Alene district will shut down in October, though it is expected that the market conditions will warrant resumption of output in a short time. The Allenby Copper Company of Princeton, B. C., is preparing for large operations beginning in November, when they will put in service a 2,000-ton concentrating plant.

The local packing plants and flour mills are still running at high output.

Denver

Improvement in the economic position of agricultural, mining, and banking interests is in evidence. Recent rains distributed over the mountain area have revived ranges and pastures and insure bumper crops and an abundance of feed to carry livestock through the coming winter. Harvesting has been delayed by cool wet weather. The sugar beet crop will exceed that of last year with greater returns to the farmer, thanks to the increased price of sugar.

Denver leads all cities in the Tenth Reserve district in savings deposits, and checking deposits in local banks show over a two million dollar increase since the July reports. Clearings for the month of September totaled $134,937,823, an increase of 2.5 per cent over the same month last year.

Local manufacturing plants are operating steadily and in some instances working forces have been increased. Labor is scarce in many parts of the state, a shortage in the smelters at Leadville being attributed to the movement of workers to the agricultural districts. Aggregate value of metal mines in this region shows a marked increase over 1922 both in value and quantity of ore. Soft coal mining operations as well as metal mining show a fifty per cent increase over last year.

Building permits up to Oct. 1 already amount to within $1,623,645 of the total amount of building done during 1922, which was the greatest building year in Denver's history. Permits issued during September amounted to $2,011,000 and there is still little sign of any cessation of activity, although building is confined more to larger projects than it was several months ago.

Local electrical jobbers and manufacturers report a fair volume of business with better profit margins while all of the principal central stations are reporting an increase in gross revenues. The situation with the contractor-dealer is practically unchanged.

Salt Lake City

Based on actual figures up to Oct. 1, 1923, and estimates for the remaining three months of the year, building permits in Salt Lake City for the year 1923 will exceed those of 1922 by 40 per cent, in amount of money represented.

Considerable progress is being made in the work of the Columbia Steel Company. Iron ore from the company's properties in Iron County will begin arriving in Ironton, near Provo, Utah, about the first of November. In the meantime construction work on the new steel plant is thirty days ahead of schedule. This new iron and steel industry is looked upon as a very important factor in the program of industrial development which is now very much in evidence in the intermountain section.

The mining industry continues to thrive. The demand for copper is reported as being remarkably good, despite the low price quoted for the metal.

The sugar-making campaign is now under way, with the numerous factories throughout this section operating at full capacity.

Electrical jobbers continue to report business showing a substantial increase as compared with the same period last year. The retail business, however, generally speaking, is showing continued improvement, with considerable activity in construction material, wiring supplies, etc.